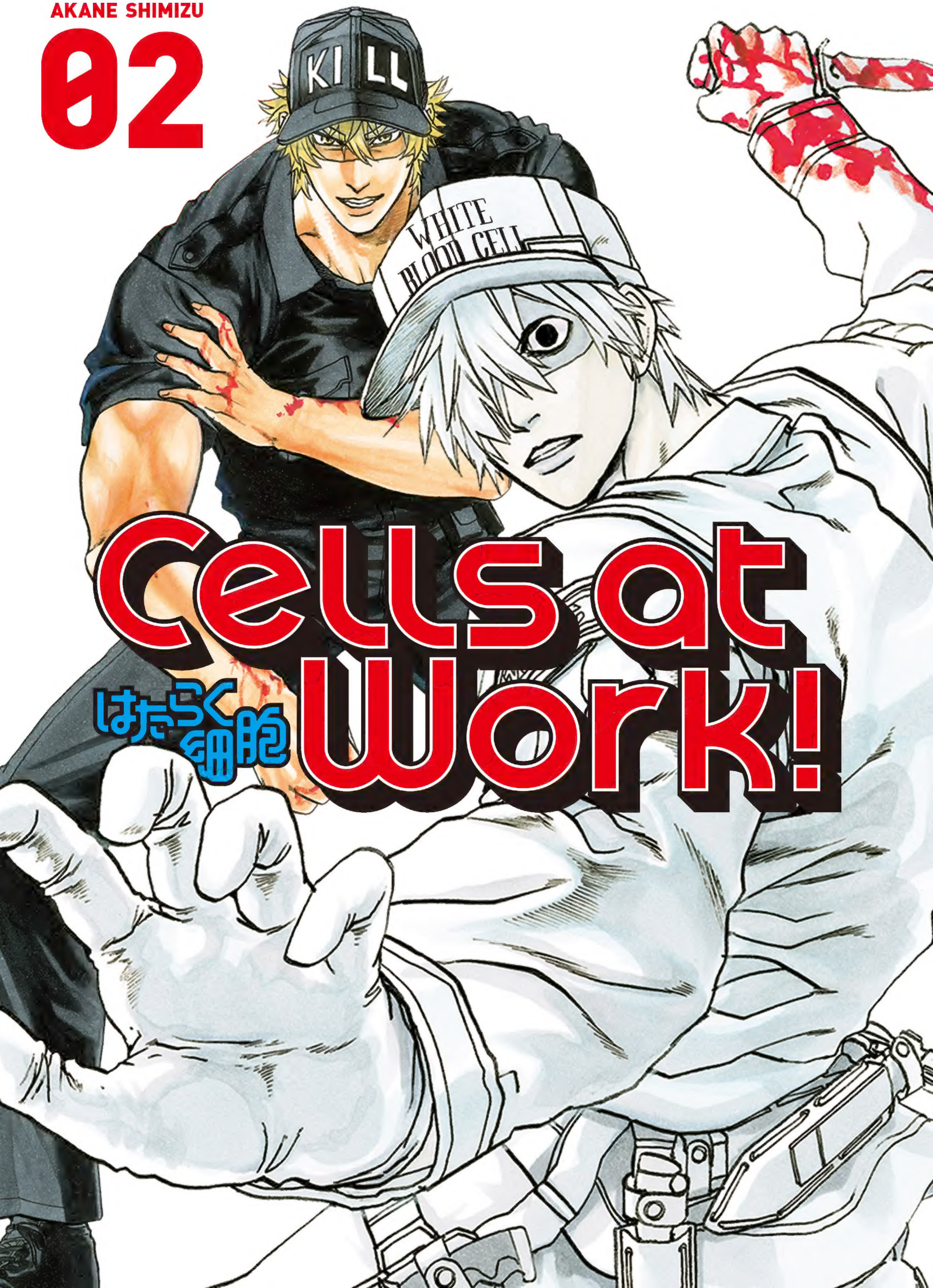
AKANE SHIMIZU

02

Cells at Work!

はたらく細胞


KILL
WHITE BLOOD CELL

Cells at Work!

はたらく細胞

02

AKANE SHIMIZU

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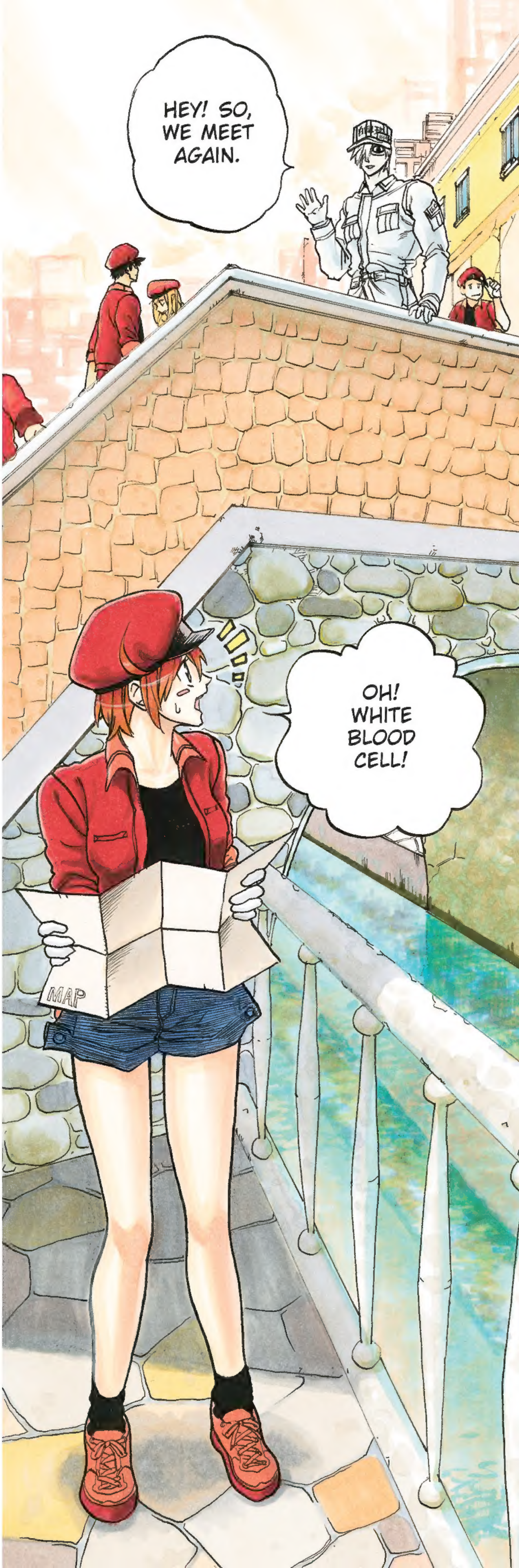
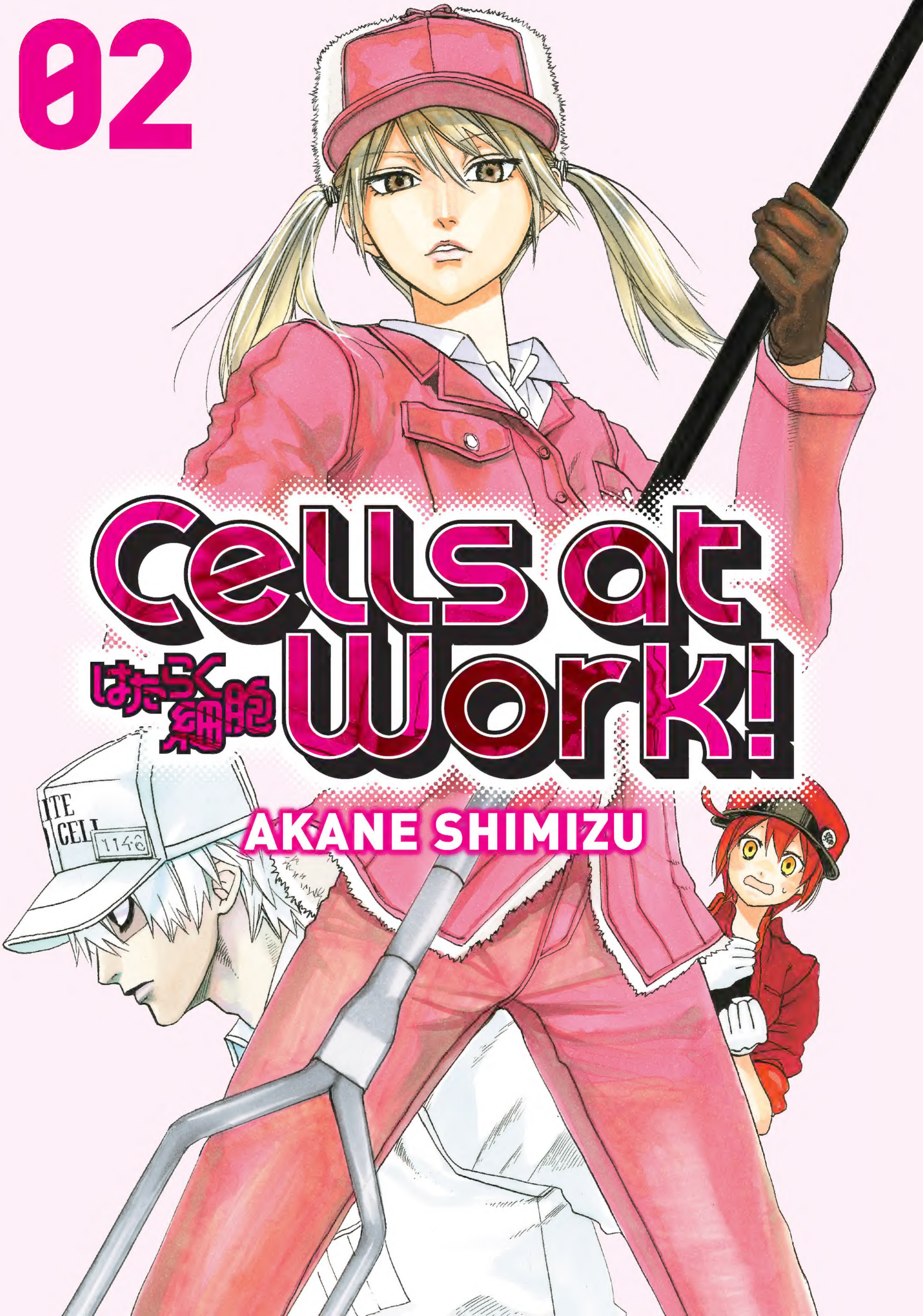

HEY! SO, WE MEET AGAIN.
OH! WHITE BLOOD CELL!
MAP

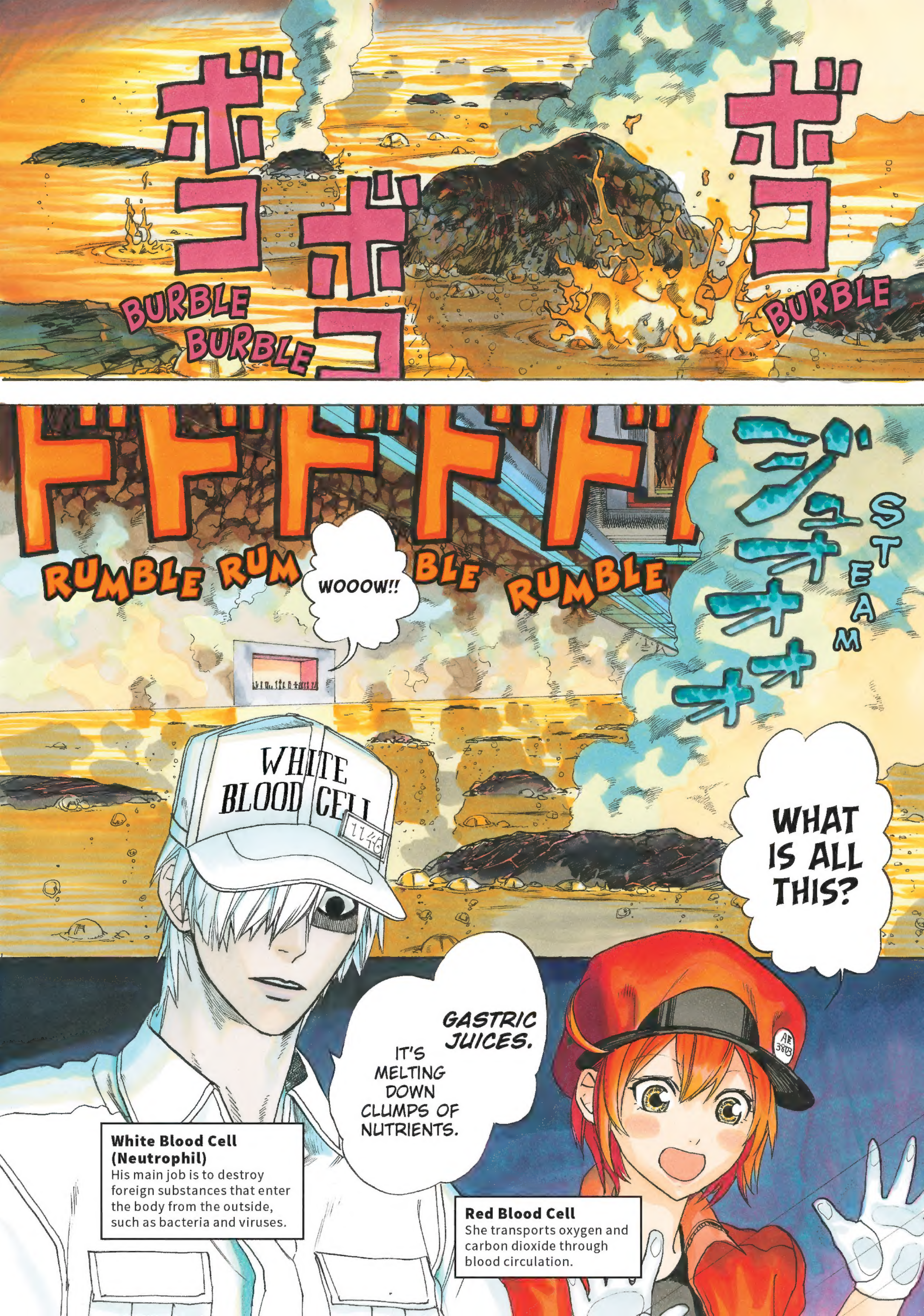
02

Cells at Work!

はたらく細胞

AKANE SHIMIZU

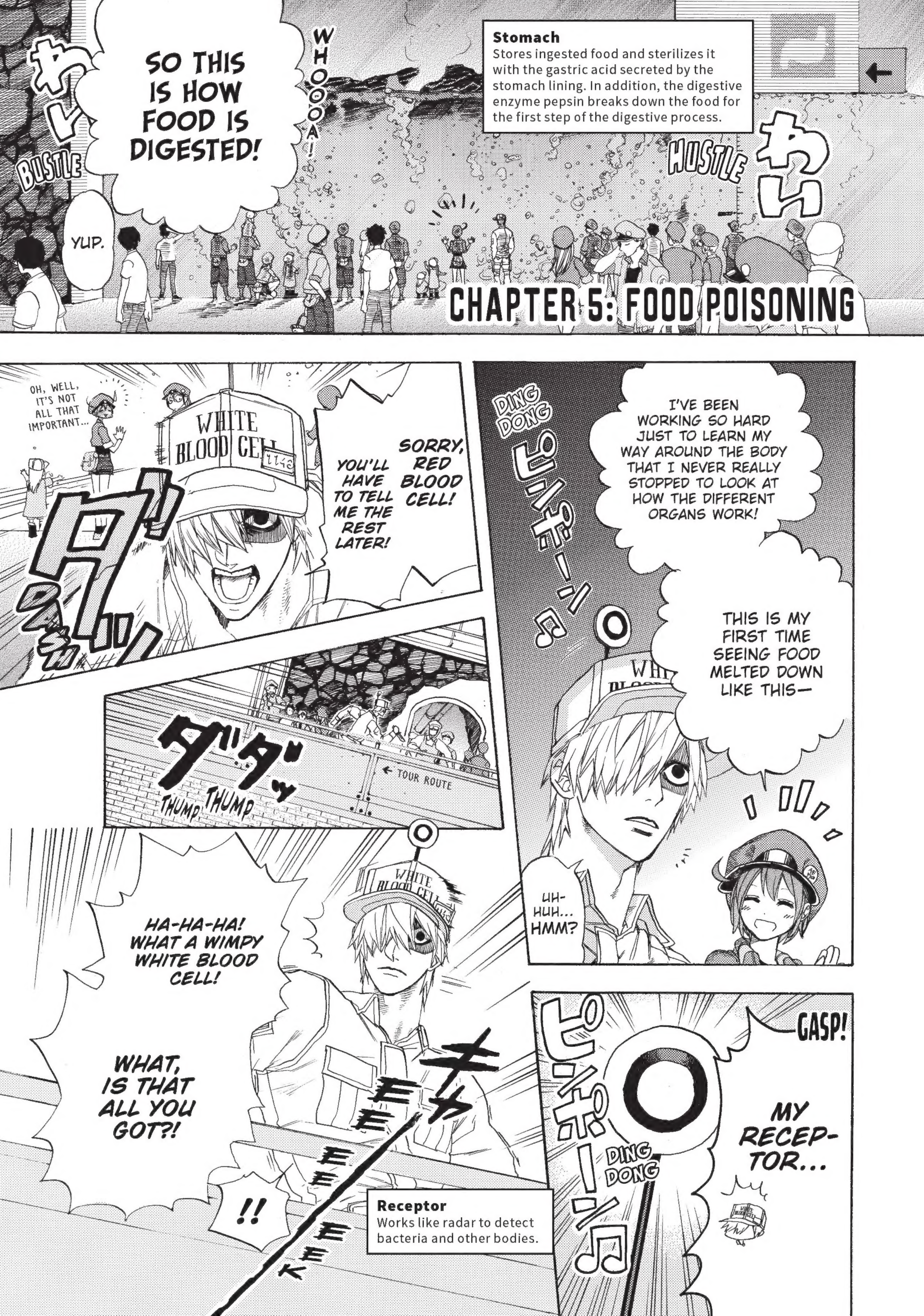

ITE
CELL
1146


ボコ
BURBLE
ボコ
ボコ
BURBLE
BURBLE
ジュオオオオ
STEAM
ドドドドド
RUMBLE RUMBLE RUMBLE
WOOOW!!
WHAT IS ALL THIS?
WHITE BLOOD CELL
1146
AE 3803
GASTRIC JUICES.
IT'S MELTING DOWN CLUMPS OF NUTRIENTS.

Red Blood Cell
She transports oxygen and carbon dioxide through blood circulation.

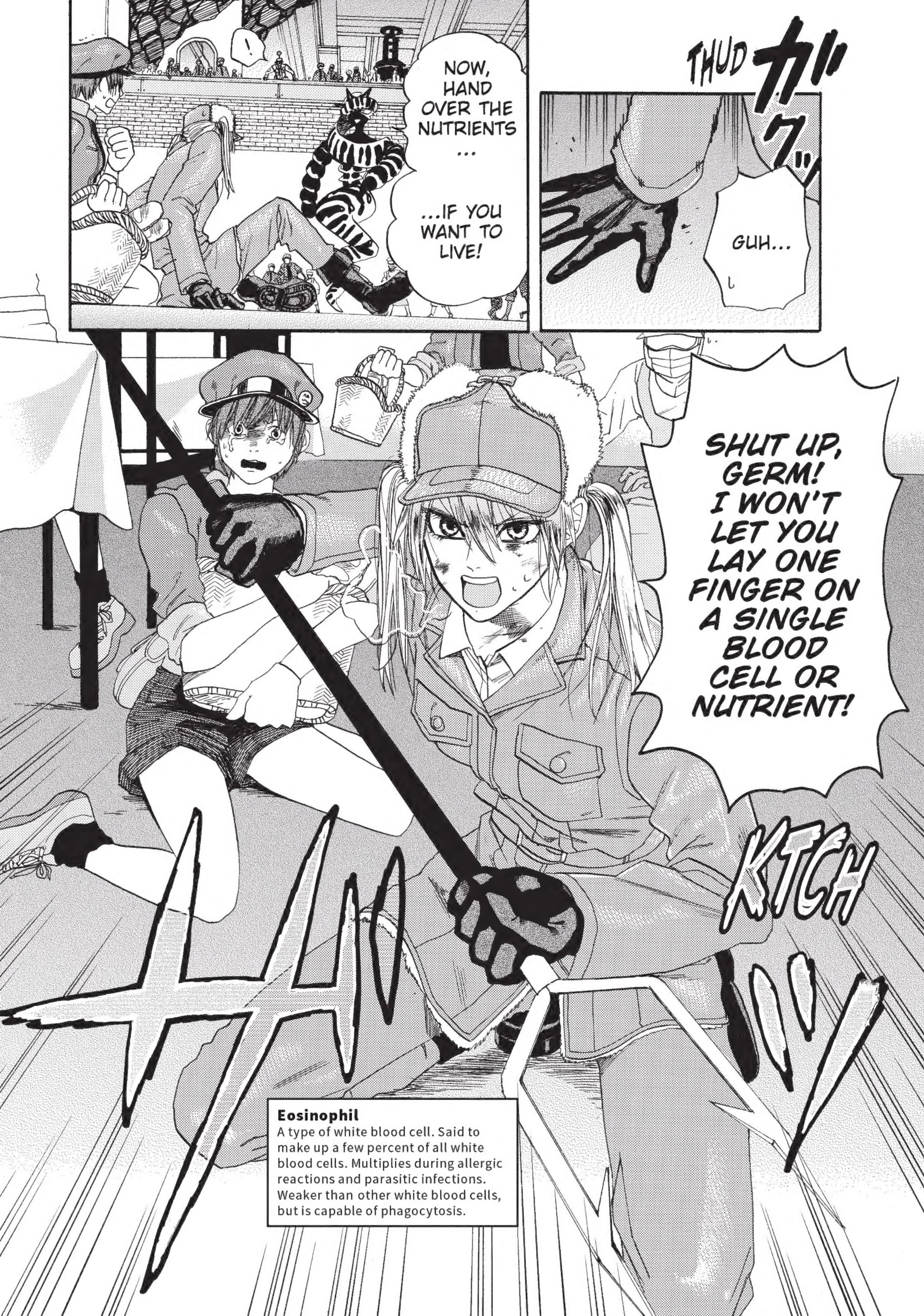
White Blood Cell (Neutrophil)
His main job is to destroy foreign substances that enter the body from the outside, such as bacteria and viruses.

CHAPTER 5: FOOD POISONING

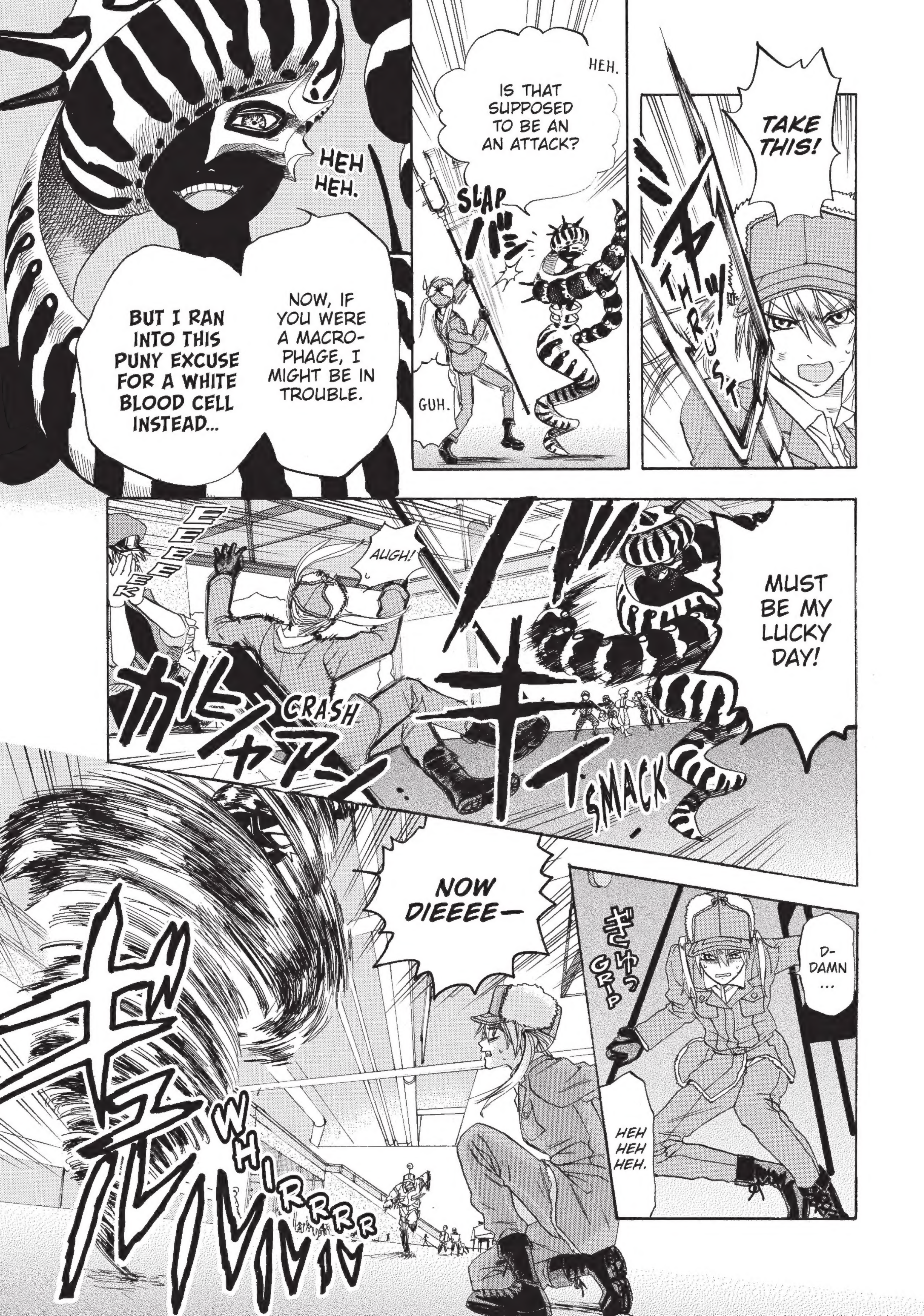

わいわい
HUSTLE
WHOOOOA!
SO THIS IS HOW FOOD IS DIGESTED!
わいわい
BUSTLE
YUP.
DING DONG
ピンポーン♫
I'VE BEEN WORKING SO HARD JUST TO LEARN MY WAY AROUND THE BODY THAT I NEVER REALLY STOPPED TO LOOK AT HOW THE DIFFERENT ORGANS WORK!
THIS IS MY FIRST TIME SEEING FOOD MELTED DOWN LIKE THIS—
UH-HUH... HMM?
WHITE BLOOD CELL
SORRY, RED BLOOD CELL!
YOU'LL HAVE TO TELL ME THE REST LATER!
OH, WELL, IT'S NOT ALL THAT IMPORTANT...
ダッ
DASH
ダダッ
THUMP THUMP
← TOUR ROUTE
GASP!
MY RECEPTOR...
ピンポーン♫
DING DONG
HA-HA-HA! WHAT A WIMPY WHITE BLOOD CELL!
WHAT, IS THAT ALL YOU GOT?!
キーカ
EEEEEEEK
!!

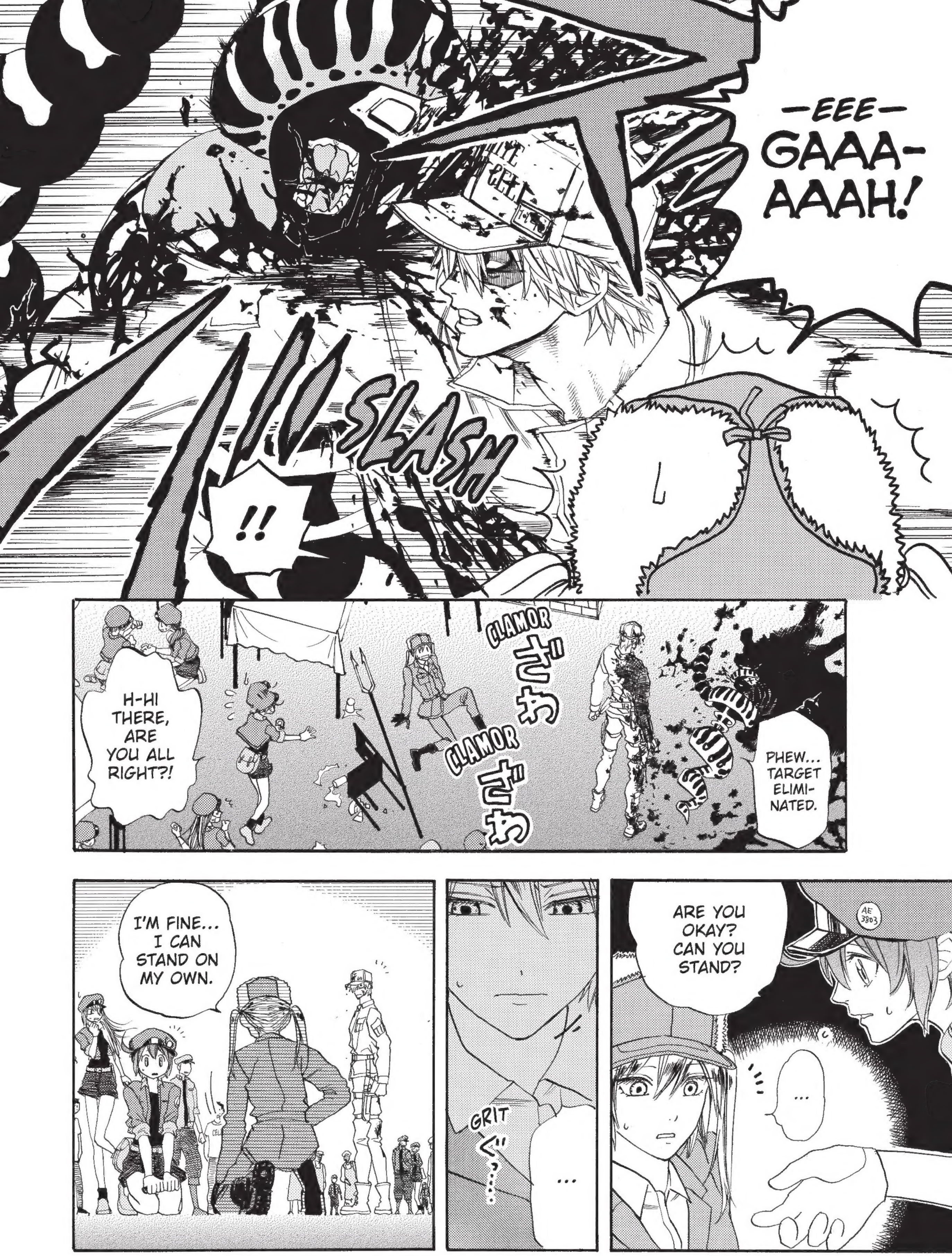
Stomach
Stores ingested food and sterilizes it with the gastric acid secreted by the stomach lining. In addition, the digestive enzyme pepsin breaks down the food for the first step of the digestive process.

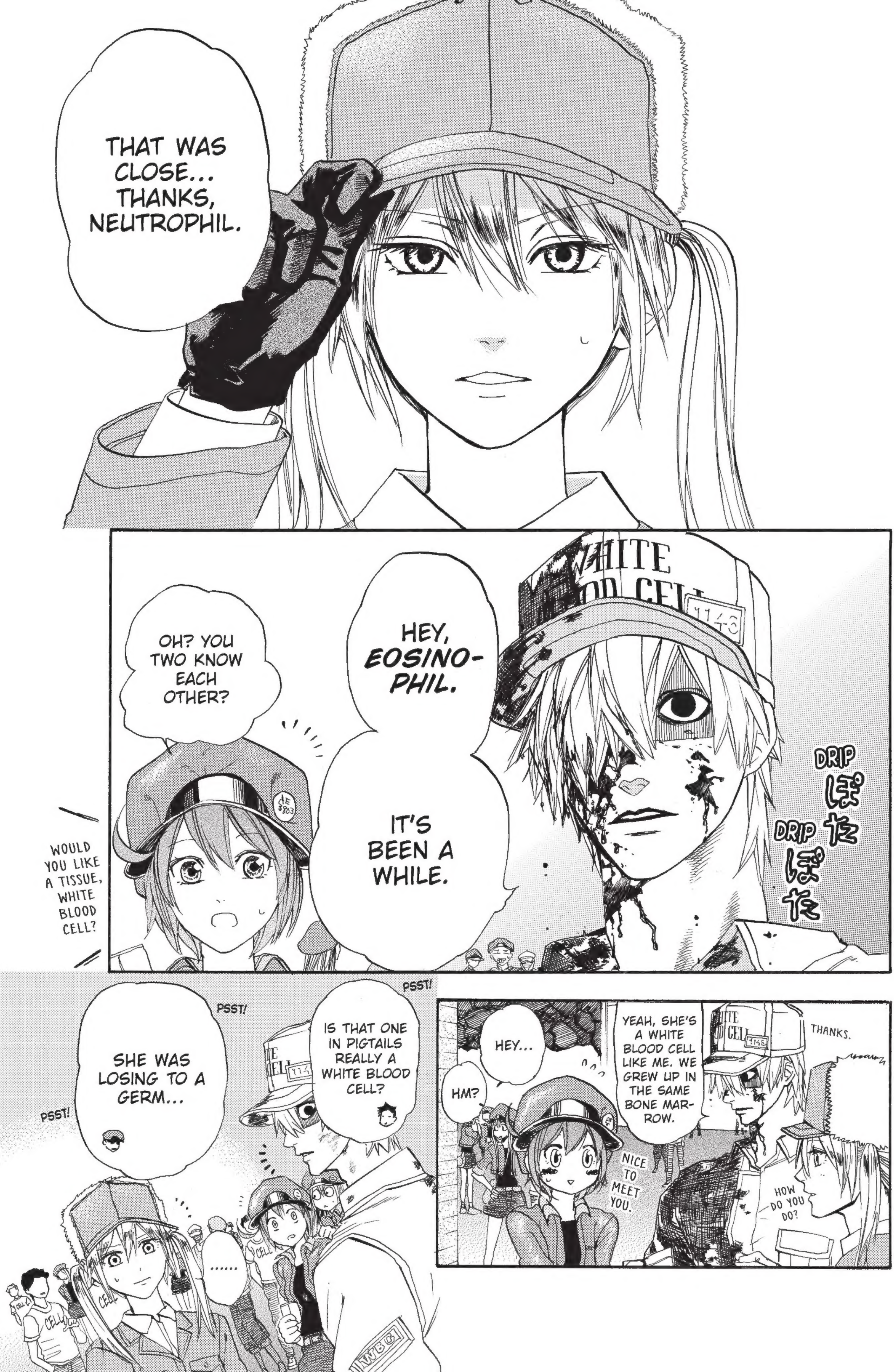
Receptor
Works like radar to detect bacteria and other bodies.

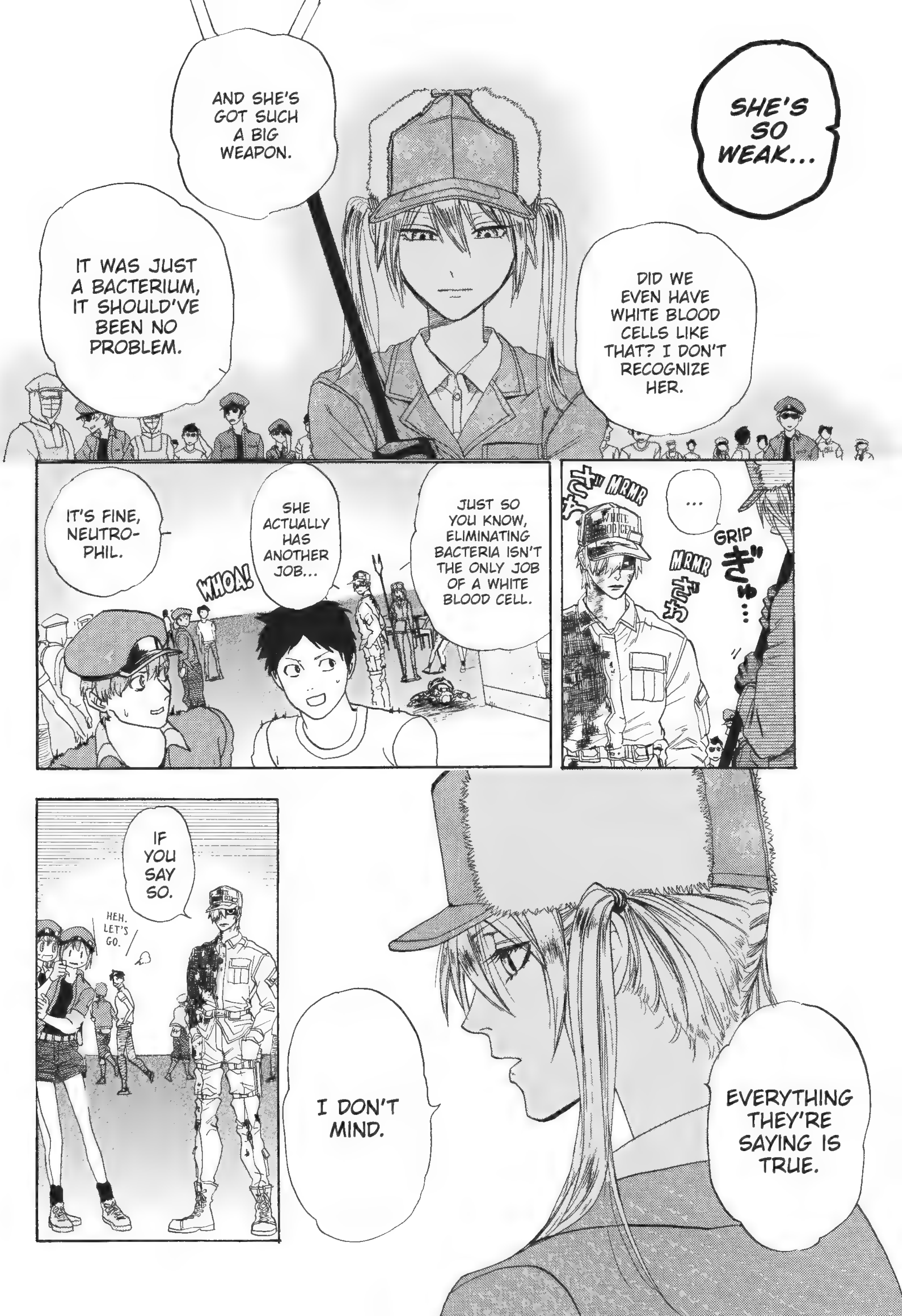

THUD
ガグッ
GUH...
!
NOW, HAND OVER THE NUTRIENTS...
...IF YOU WANT TO LIVE!
SHUT UP, GERM! I WON'T LET YOU LAY ONE FINGER ON A SINGLE BLOOD CELL OR NUTRIENT!
KTCH

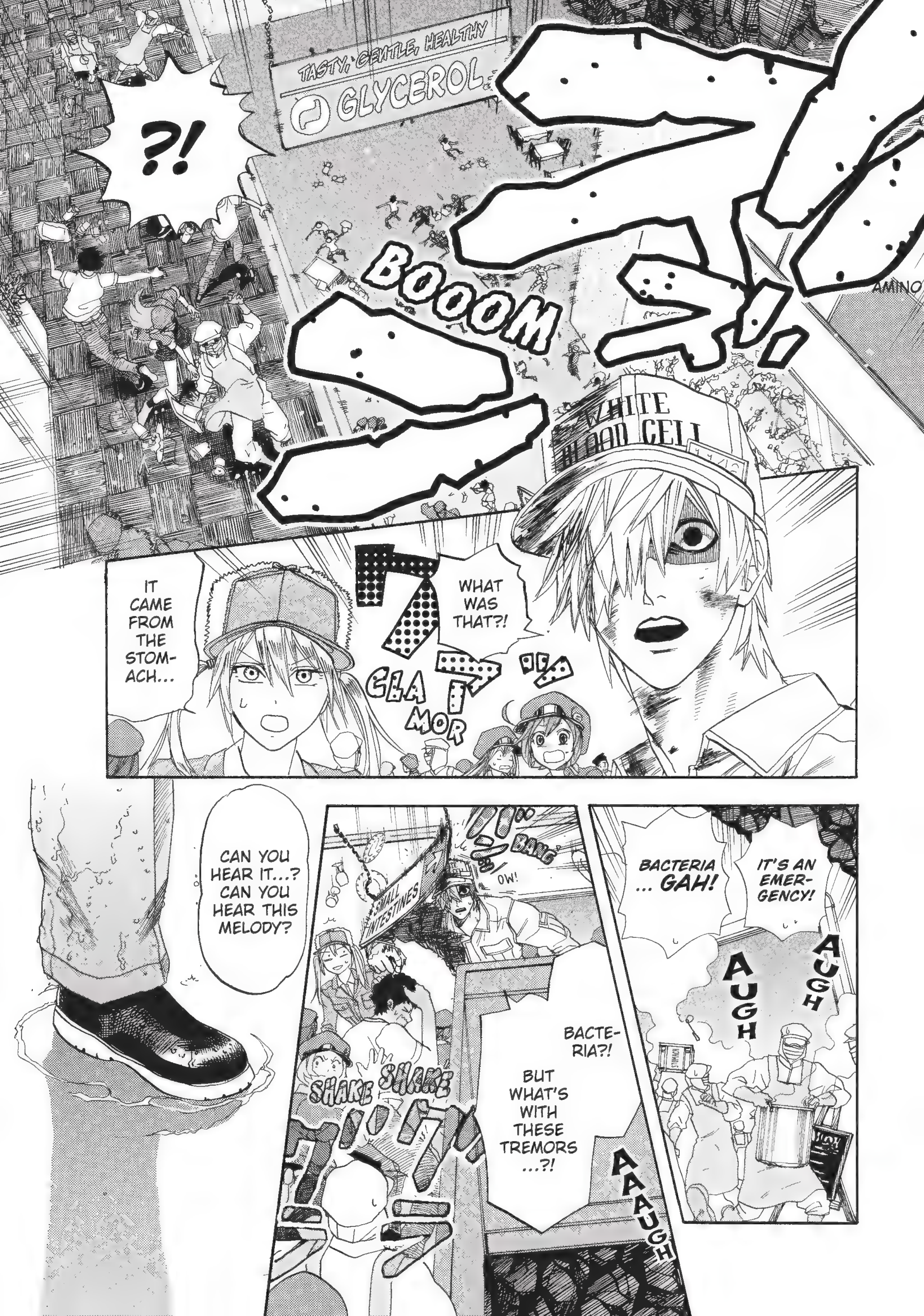
Eosinophil
A type of white blood cell. Said to make up a few percent of all white blood cells. Multiplies during allergic reactions and parasitic infections. Weaker than other white blood cells, but is capable of phagocytosis.

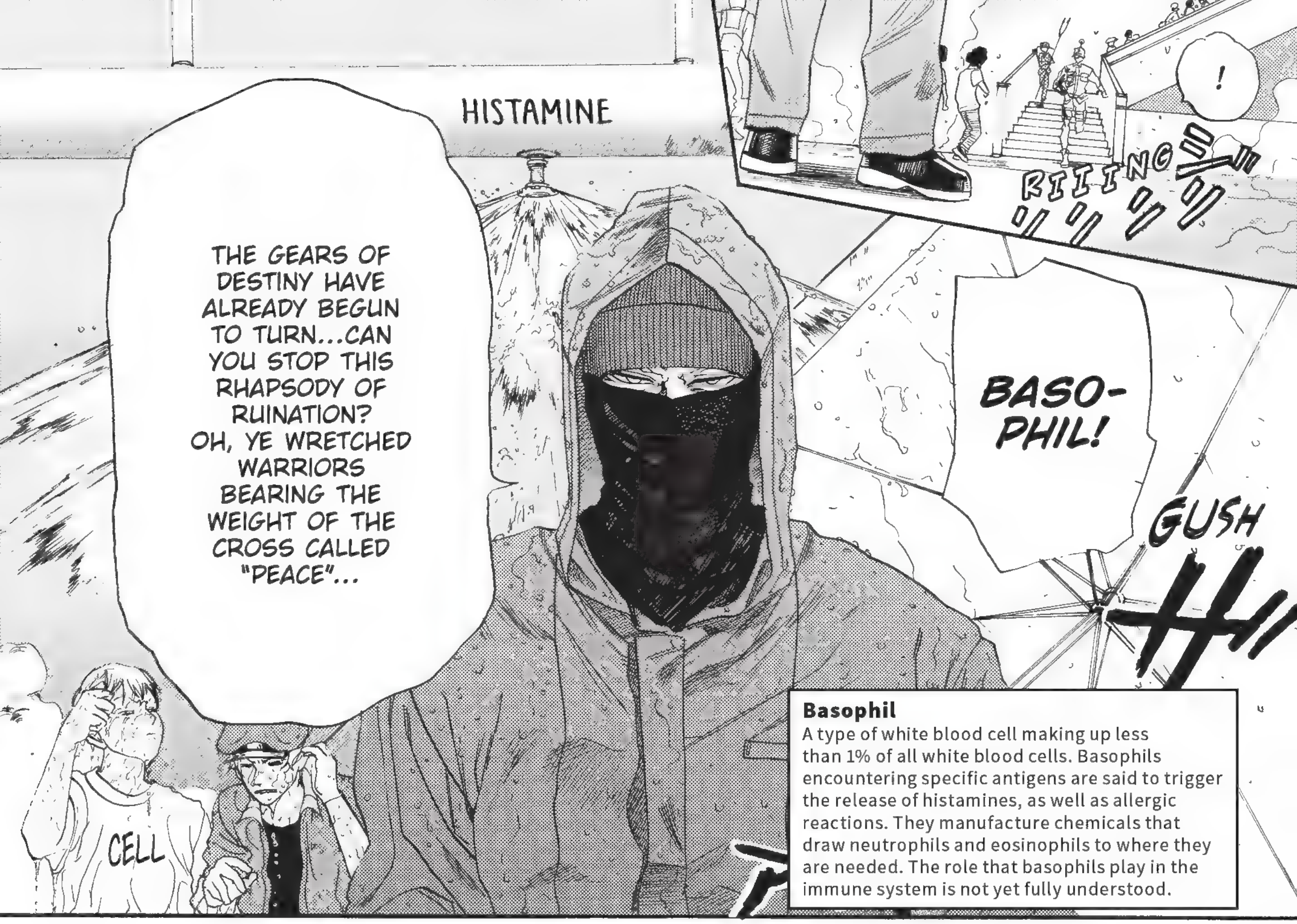

TAKE THIS!
THRUST
HEH.
IS THAT SUPPOSED TO BE AN AN ATTACK?
SLAP
GUH.
HEH HEH.
NOW, IF YOU WERE A MACROPHAGE, I MIGHT BE IN TROUBLE.
BUT I RAN INTO THIS PUNY EXCUSE FOR A WHITE BLOOD CELL INSTEAD...
MUST BE MY LUCKY DAY!
SMACK
AUGH!
CRASH
EEEEEK
D-DAMN...
GRIP
HEH HEH HEH.
NOW DIEEEE—
WHIRRRRR


—EEE— GAAA-AAAH!
SLASH
!!
PHEW... TARGET ELIMINATED.
CLAMOR ざわ
CLAMOR ざわ
H-HI THERE, ARE YOU ALL RIGHT?!
ARE YOU OKAY? CAN YOU STAND?
AE 3803
...
GRIT ぐっ......
...
I'M FINE... I CAN STAND ON MY OWN.

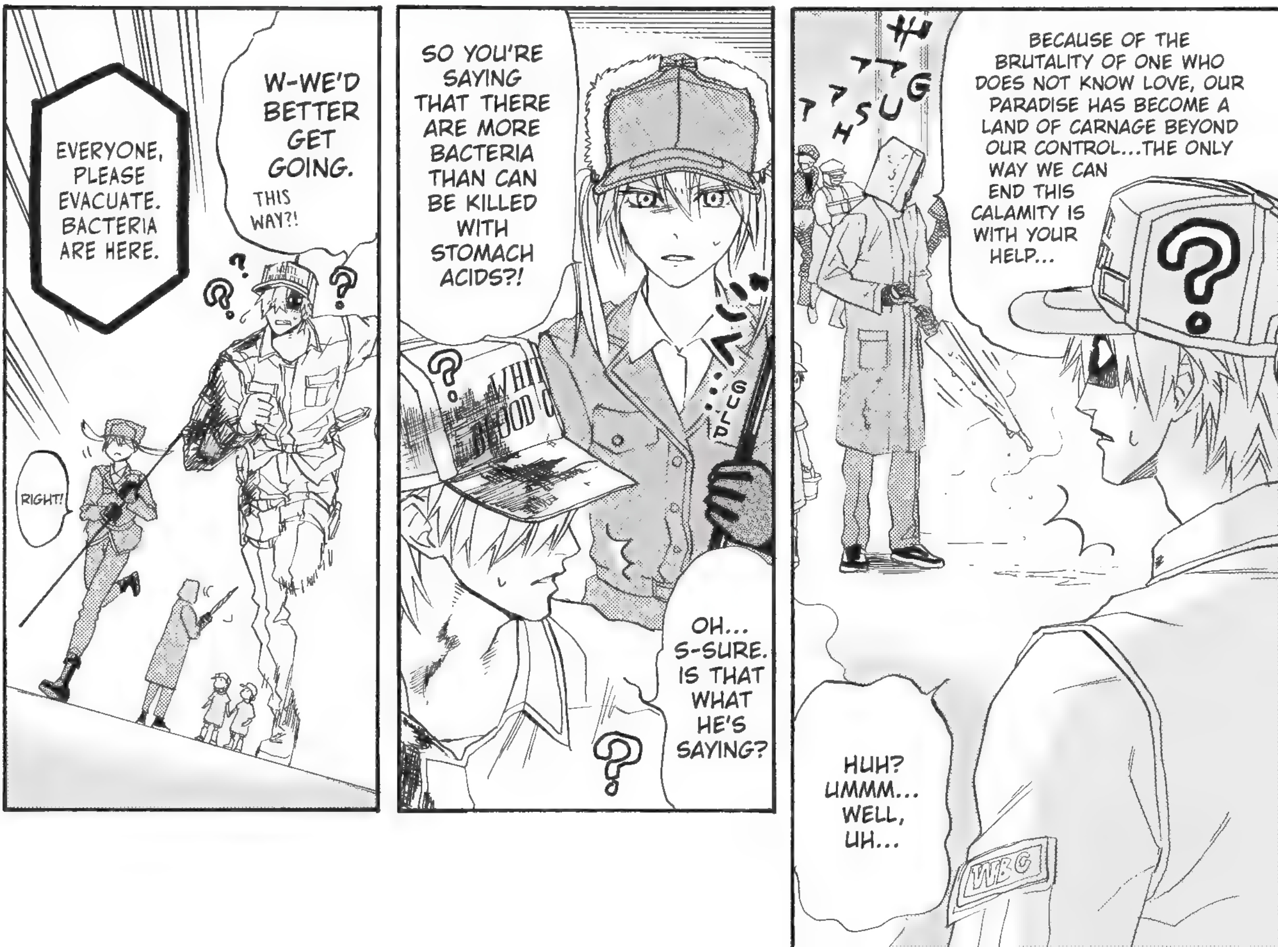

THAT WAS CLOSE... THANKS, NEUTROPHIL.
WHITE BLOOD CELL 1146
DRIP ぽた DRIP ぽた
HEY, *EOSINOPHIL.*
IT'S BEEN A WHILE.
OH? YOU TWO KNOW EACH OTHER?
AE 3803
WOULD YOU LIKE A TISSUE, WHITE BLOOD CELL?
THANKS.
HEY...
HM?
YEAH, SHE'S A WHITE BLOOD CELL LIKE ME. WE GREW UP IN THE SAME BONE MARROW.
HOW DO YOU DO?
NICE TO MEET YOU.
PSST!
IS THAT ONE IN PIGTAILS REALLY A WHITE BLOOD CELL?
PSST!
SHE WAS LOSING TO A GERM...
PSST!
......
CELL
WBC

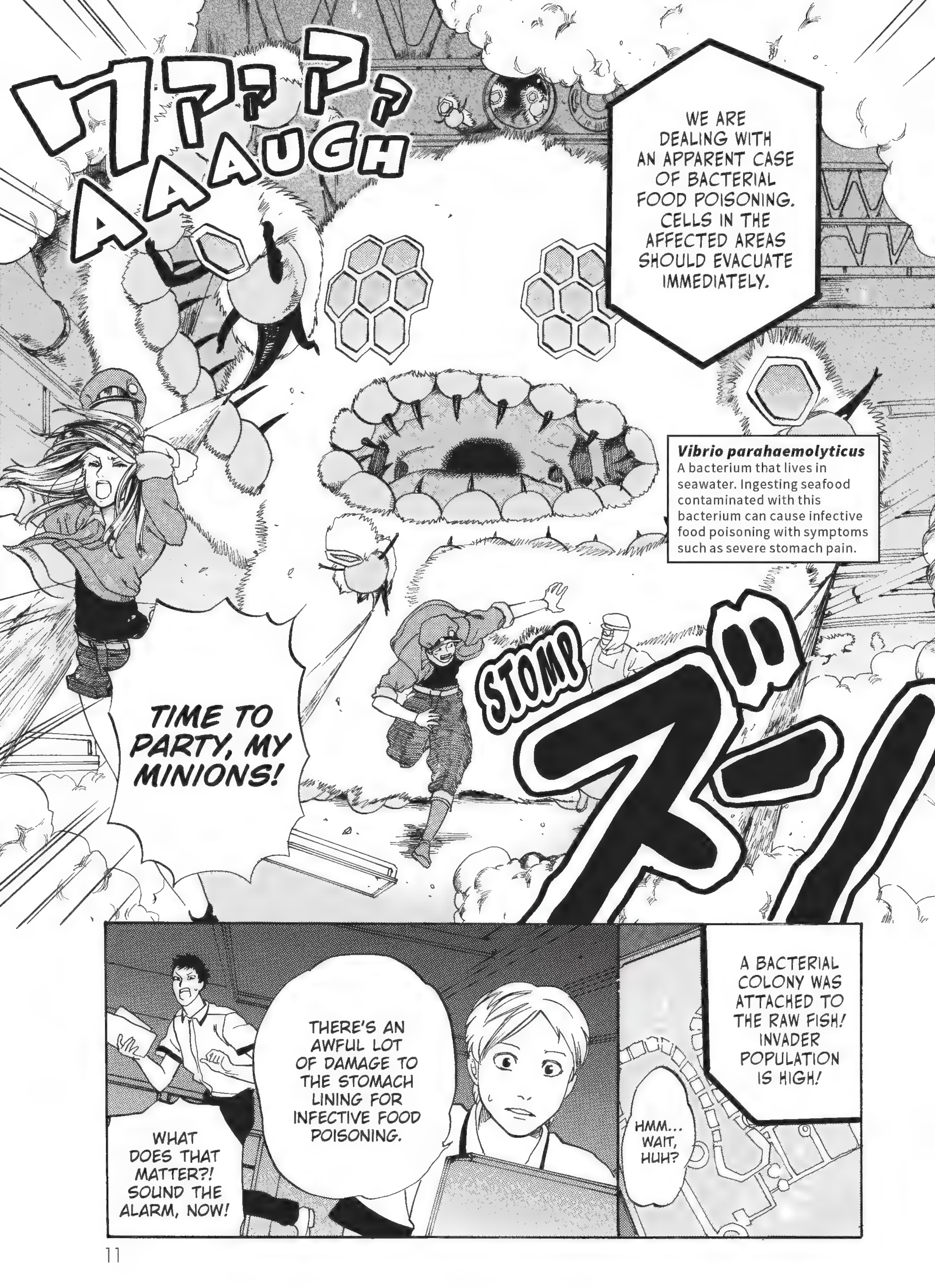

SHE'S SO WEAK...
AND SHE'S GOT SUCH A BIG WEAPON.
DID WE EVEN HAVE WHITE BLOOD CELLS LIKE THAT? I DON'T RECOGNIZE HER.
IT WAS JUST A BACTERIUM, IT SHOULD'VE BEEN NO PROBLEM.
ざわ MRMR
ざわ MRMR
...
GRIP ぎゅ…
WHITE BLOOD CELL
JUST SO YOU KNOW, ELIMINATING BACTERIA ISN'T THE ONLY JOB OF A WHITE BLOOD CELL.
SHE ACTUALLY HAS ANOTHER JOB...
WHOA!
IT'S FINE, NEUTROPHIL.
EVERYTHING THEY'RE SAYING IS TRUE.
I DON'T MIND.
IF YOU SAY SO.
HEH. LET'S GO.


TASTY, GENTLE, HEALTHY
GLYCEROL
AMINO
?!
BOOOM
WHITE BLOOD CELL
WHAT WAS THAT?!
IT CAME FROM THE STOMACH...
CLAMOR
IT'S AN EMERGENCY!
BACTERIA ... GAH!
AUGH
AUGH
STOMACH
BANG
OW!
SMALL INTESTINES
BACTERIA?!
BUT WHAT'S WITH THESE TREMORS ...?!
SHAKE
SHAKE
AAAUGH
CAN YOU HEAR IT...? CAN YOU HEAR THIS MELODY?

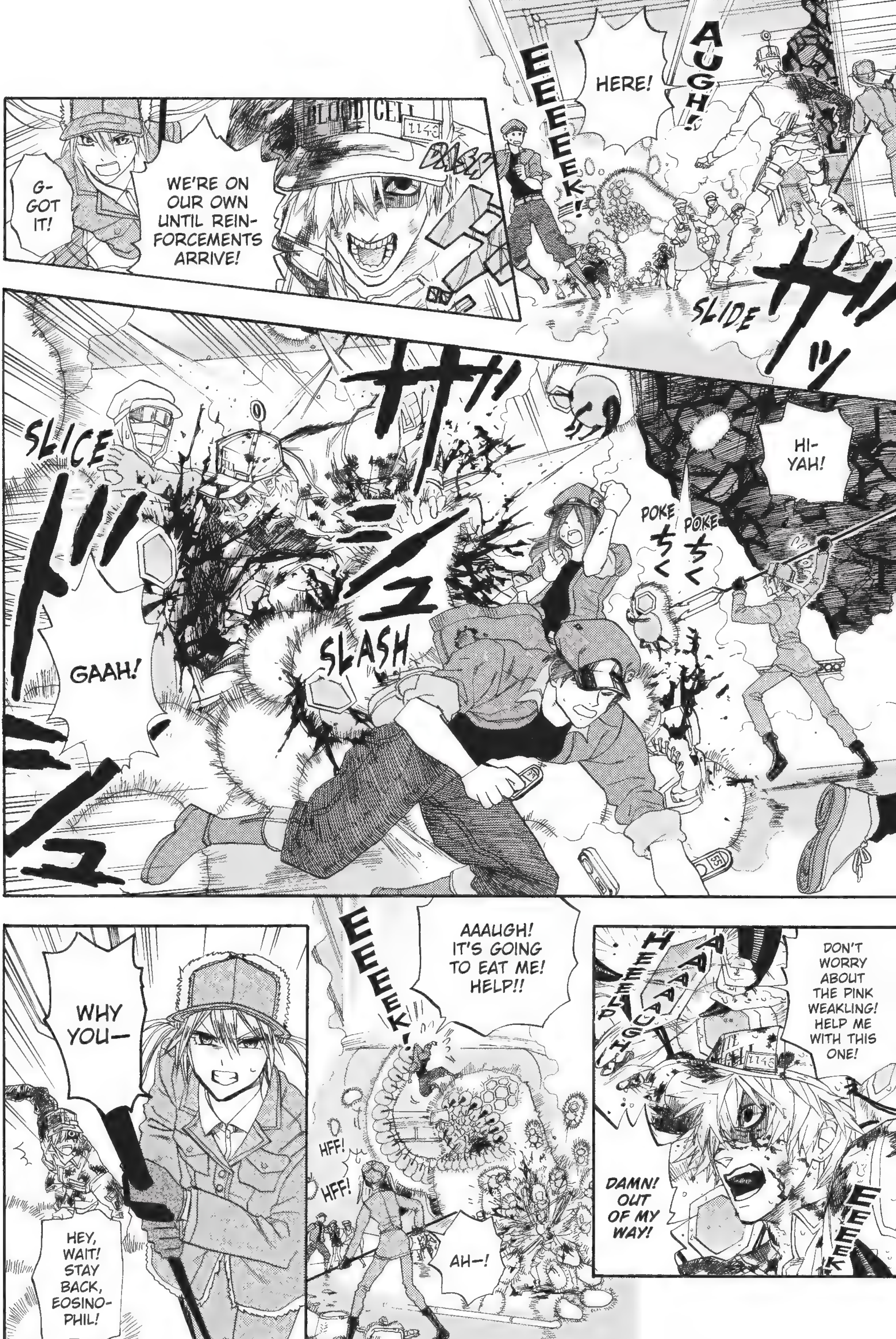

!
RIIING
BASO-PHIL!
GUSH
HISTAMINE
THE GEARS OF DESTINY HAVE ALREADY BEGUN TO TURN...CAN YOU STOP THIS RHAPSODY OF RUINATION? OH, YE WRETCHED WARRIORS BEARING THE WEIGHT OF THE CROSS CALLED "PEACE"...
CELL

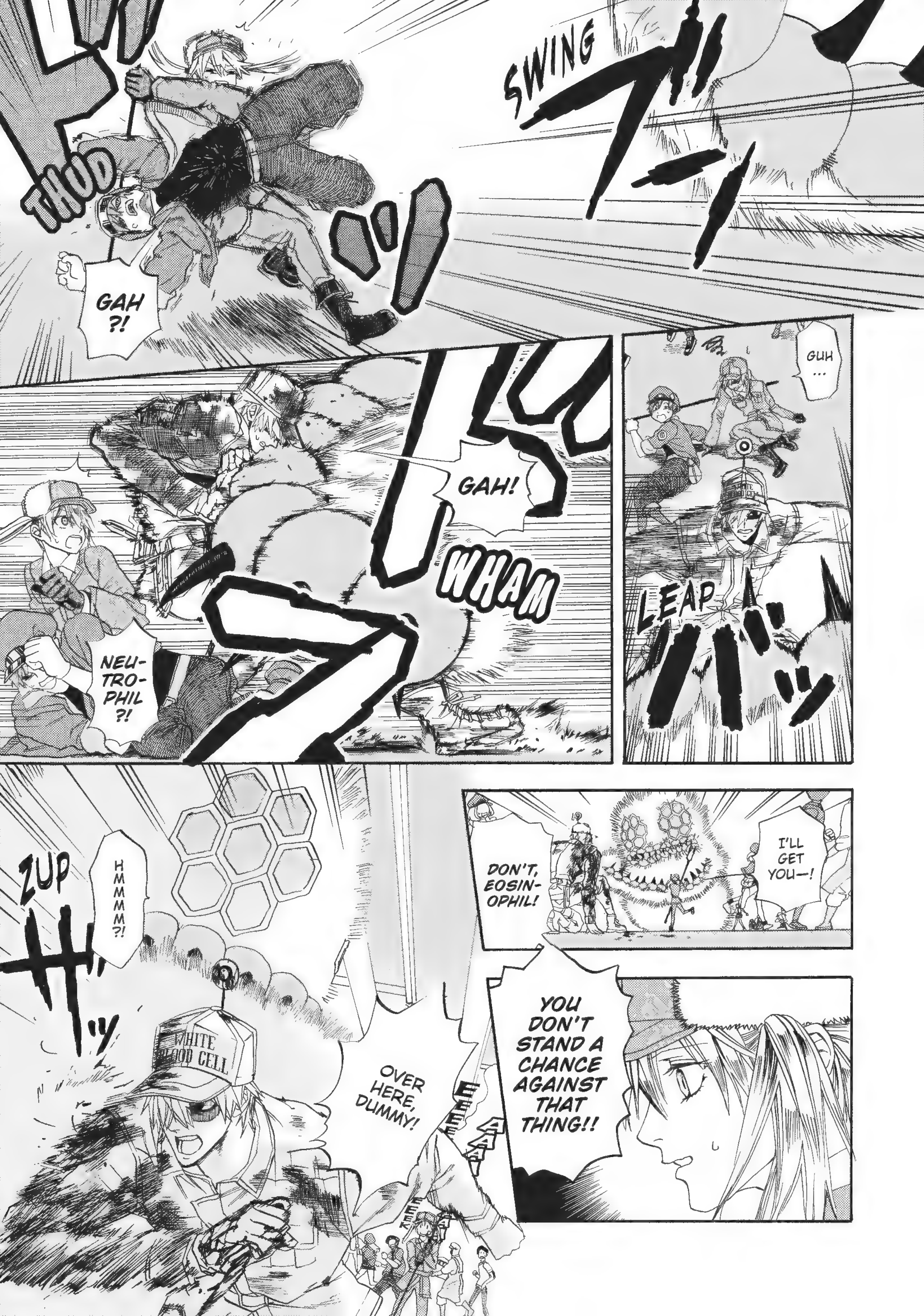
Basophil
A type of white blood cell making up less than 1% of all white blood cells. Basophils encountering specific antigens are said to trigger the release of histamines, as well as allergic reactions. They manufacture chemicals that draw neutrophils and eosinophils to where they are needed. The role that basophils play in the immune system is not yet fully understood.

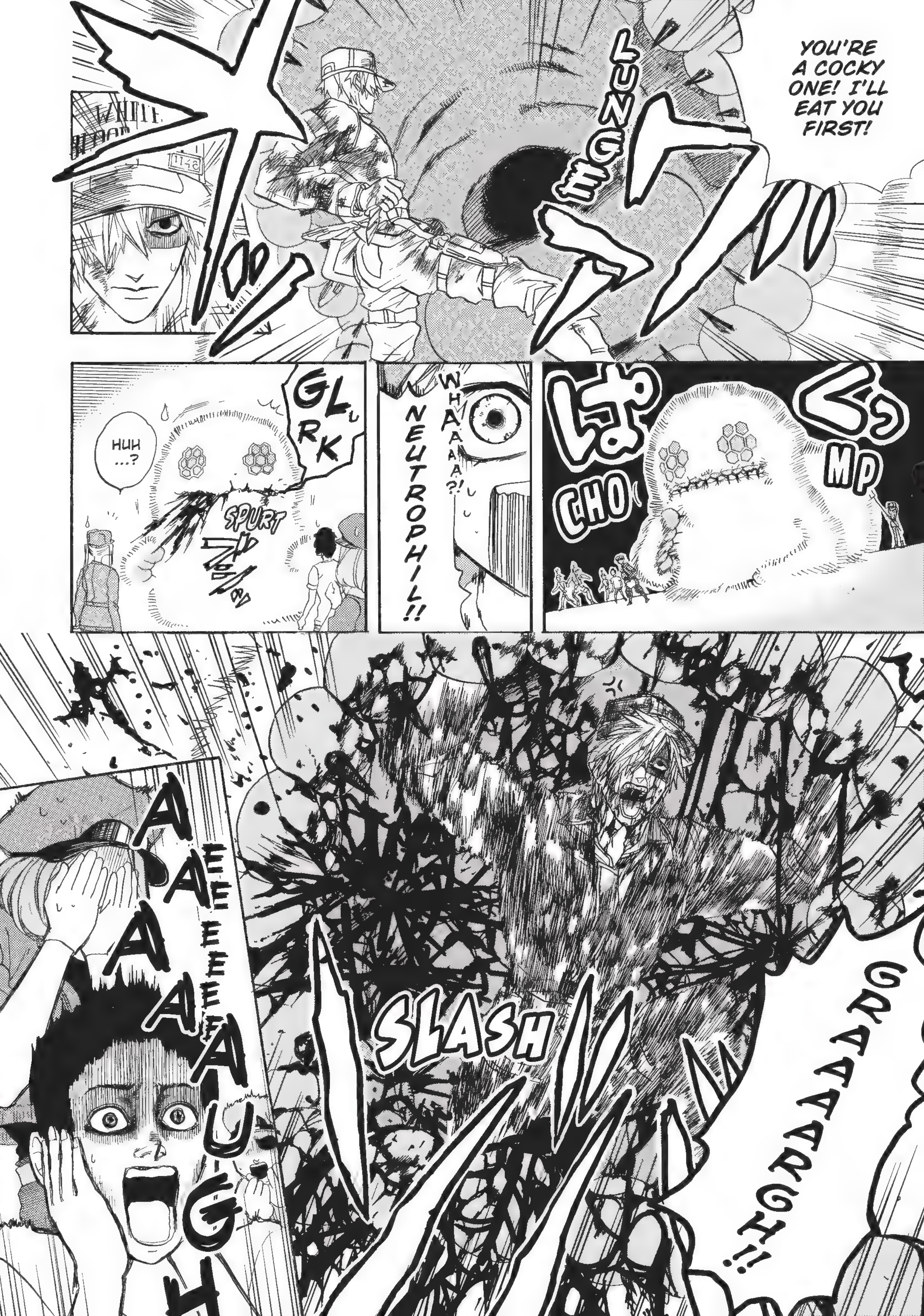

BECAUSE OF THE BRUTALITY OF ONE WHO DOES NOT KNOW LOVE, OUR PARADISE HAS BECOME A LAND OF CARNAGE BEYOND OUR CONTROL...THE ONLY WAY WE CAN END THIS CALAMITY IS WITH YOUR HELP...
GUSH
?
HUH? UMMM... WELL, UH...
WBC
SO YOU'RE SAYING THAT THERE ARE MORE BACTERIA THAN CAN BE KILLED WITH STOMACH ACIDS?!
GULP
?
OH... S-SURE. IS THAT WHAT HE'S SAYING?
?
W-WE'D BETTER GET GOING.
THIS WAY?!
? ?
EVERYONE, PLEASE EVACUATE. BACTERIA ARE HERE.
RIGHT!

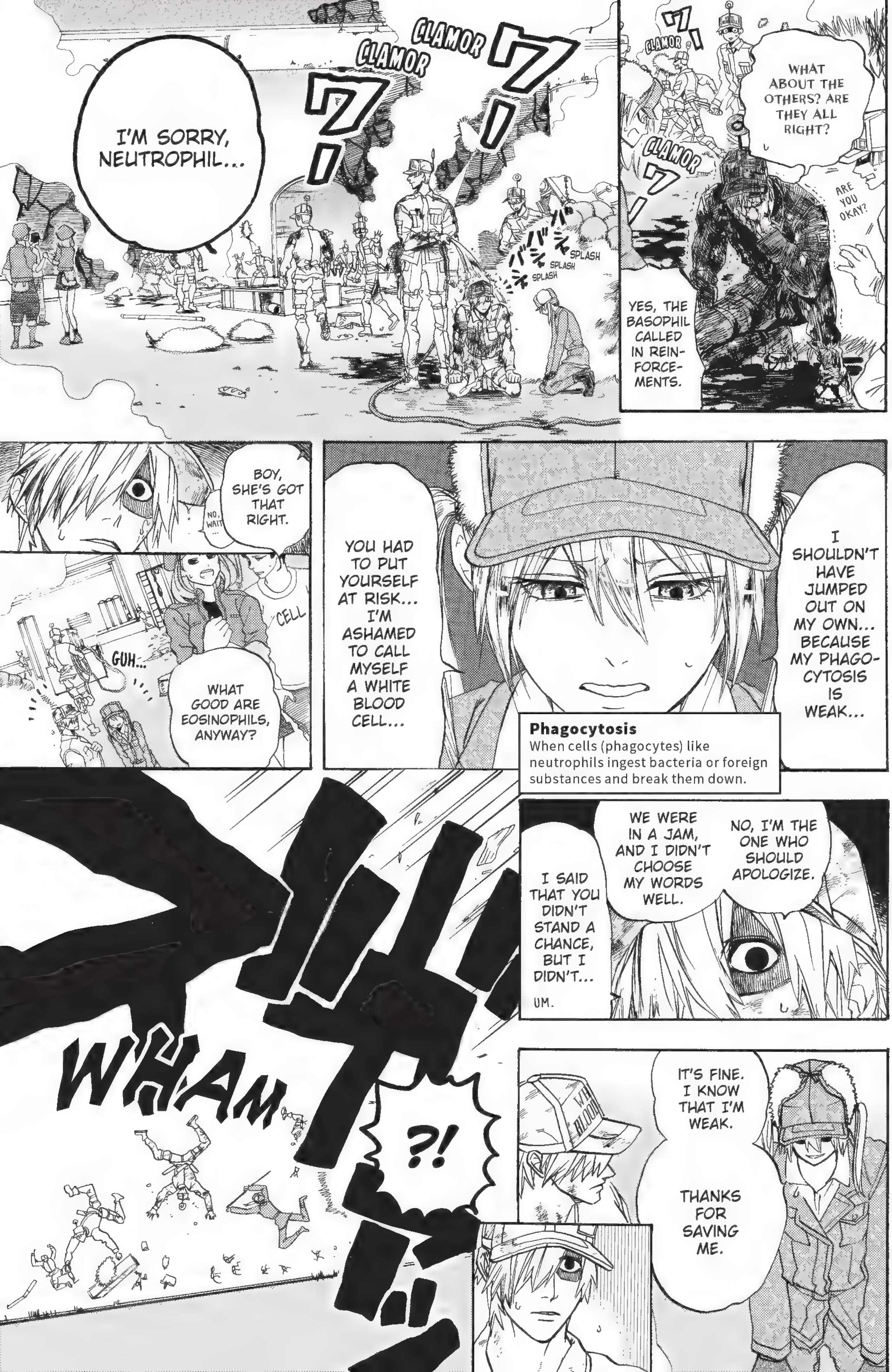

WE ARE DEALING WITH AN APPARENT CASE OF BACTERIAL FOOD POISONING. CELLS IN THE AFFECTED AREAS SHOULD EVACUATE IMMEDIATELY.
ワァァァ
AAAUGH
STOMP
TIME TO PARTY, MY MINIONS!
A BACTERIAL COLONY WAS ATTACHED TO THE RAW FISH! INVADER POPULATION IS HIGH!
HMM... WAIT, HUH?
THERE'S AN AWFUL LOT OF DAMAGE TO THE STOMACH LINING FOR INFECTIVE FOOD POISONING.
WHAT DOES THAT MATTER?! SOUND THE ALARM, NOW!

Vibrio parahaemolyticus
A bacterium that lives in seawater. Ingesting seafood contaminated with this bacterium can cause infective food poisoning with symptoms such as severe stomach pain.

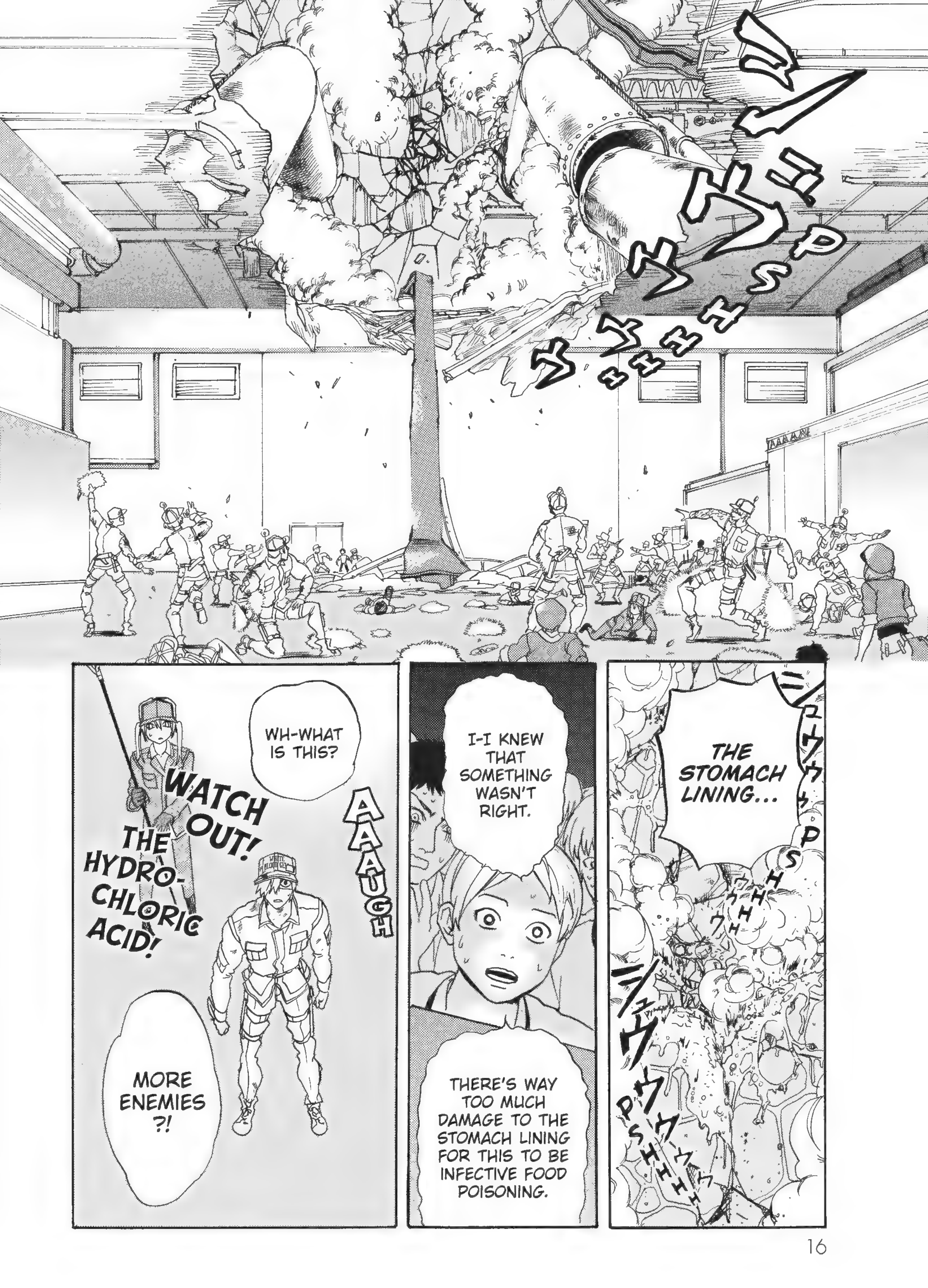

AUGH!
HERE!
EEEEEEEK!
SLIDE
WE'RE ON OUR OWN UNTIL REINFORCEMENTS ARRIVE!
G-GOT IT!
HI-YAH!
POKE ちく POKE ちく
SLASH
SLICE
GAAH!
DON'T WORRY ABOUT THE PINK WEAKLING! HELP ME WITH THIS ONE!
HAAAAUGH!
HEEEELP
EEEEK
DAMN! OUT OF MY WAY!
AAAUGH! IT'S GOING TO EAT ME! HELP!!
EEEEEK!
HFF! HFF!
AH—!
WHY YOU—
HEY, WAIT! STAY BACK, EOSINOPHIL!

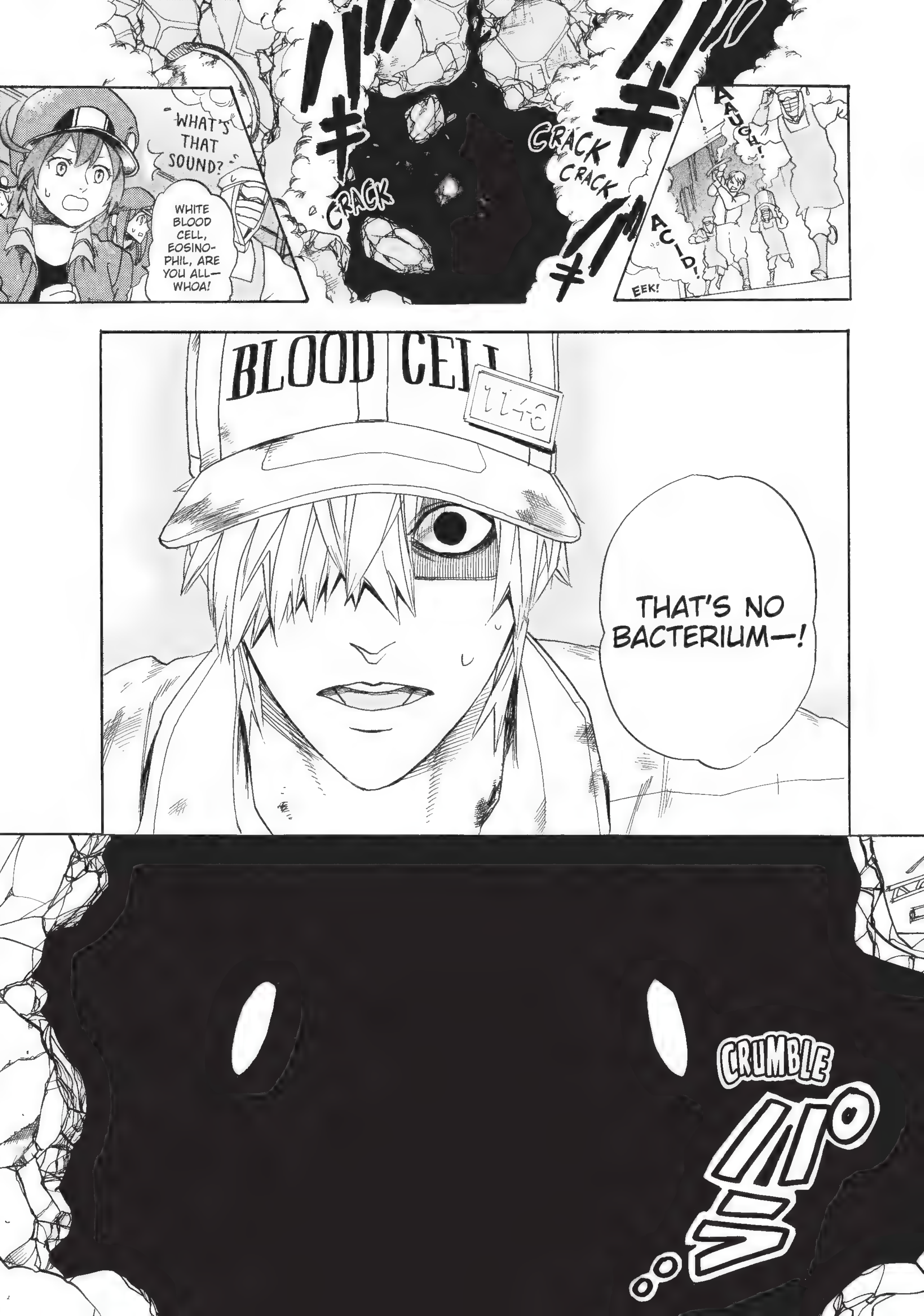

SWING
THUD
GAH ?!
GUH …
LEAP
GAH!
WHAM
NEU-TRO-PHIL ?!
I'LL GET YOU—!
DON'T, EOSIN-OPHIL!
YOU DON'T STAND A CHANCE AGAINST THAT THING!!
ZUP
HMMMMM?!
WHITE BLOOD CELL
OVER HERE, DUMMY!
EEEAAAA
EEK

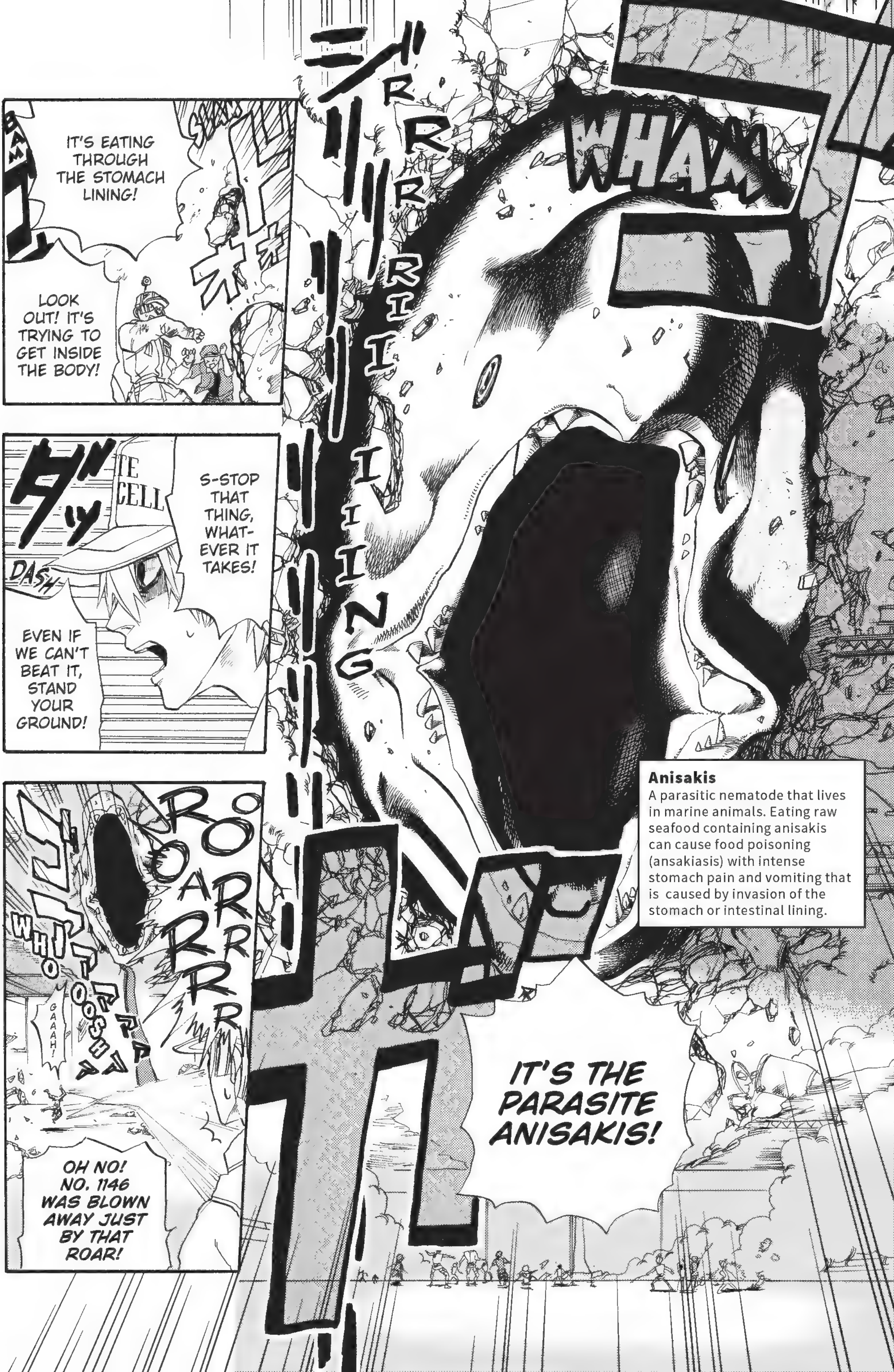

YOU'RE A COCKY ONE! I'LL EAT YOU FIRST!
LUNGE
WHITE BLOOD
1146
くっ
MP
ぱ
CHO
WHAAAA?!
NEUTROPHIL!!
GLRK
HUH ...?
SPURT
GRAAAAAARGH!!
SLASH
AAAAAAUGH
EEEEEEE


CLAMOR
WHAT ABOUT THE OTHERS? ARE THEY ALL RIGHT?
CLAMOR
ARE YOU OKAY?
YES, THE BASOPHIL CALLED IN REINFORCEMENTS.
CLAMOR
CLAMOR
I'M SORRY, NEUTROPHIL...
SPLASH
SPLASH
SPLASH
I SHOULDN'T HAVE JUMPED OUT ON MY OWN... BECAUSE MY PHAGOCYTOSIS IS WEAK...
YOU HAD TO PUT YOURSELF AT RISK... I'M ASHAMED TO CALL MYSELF A WHITE BLOOD CELL...
BOY, SHE'S GOT THAT RIGHT.
NO, WAIT...
CELL
GUH...
WHAT GOOD ARE EOSINOPHILS, ANYWAY?
NO, I'M THE ONE WHO SHOULD APOLOGIZE.
WE WERE IN A JAM, AND I DIDN'T CHOOSE MY WORDS WELL.
I SAID THAT YOU DIDN'T STAND A CHANCE, BUT I DIDN'T...
UM.
WHAM
?!
IT'S FINE. I KNOW THAT I'M WEAK.
THANKS FOR SAVING ME.

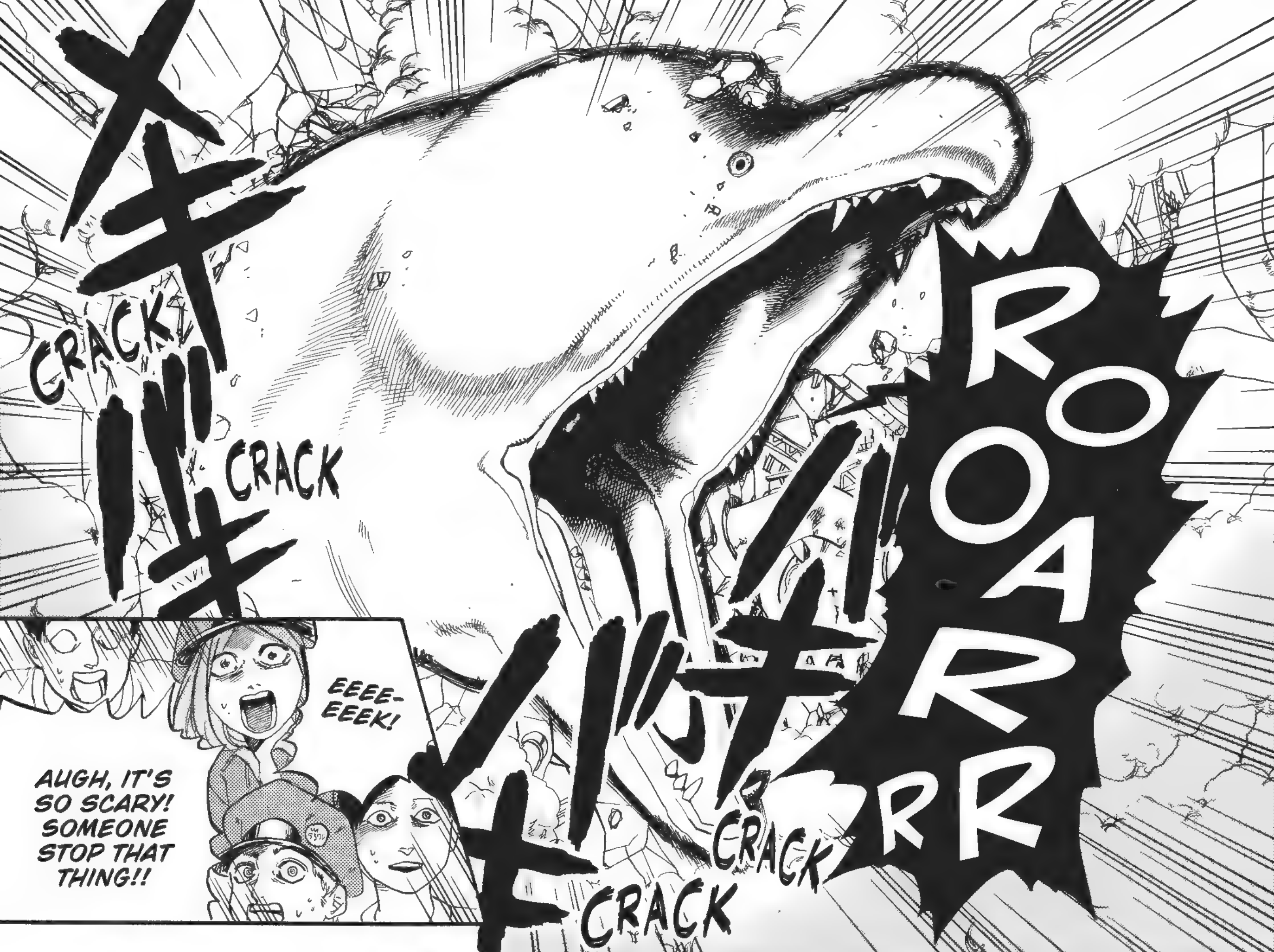
Phagocytosis
When cells (phagocytes) like neutrophils ingest bacteria or foreign substances and break them down.

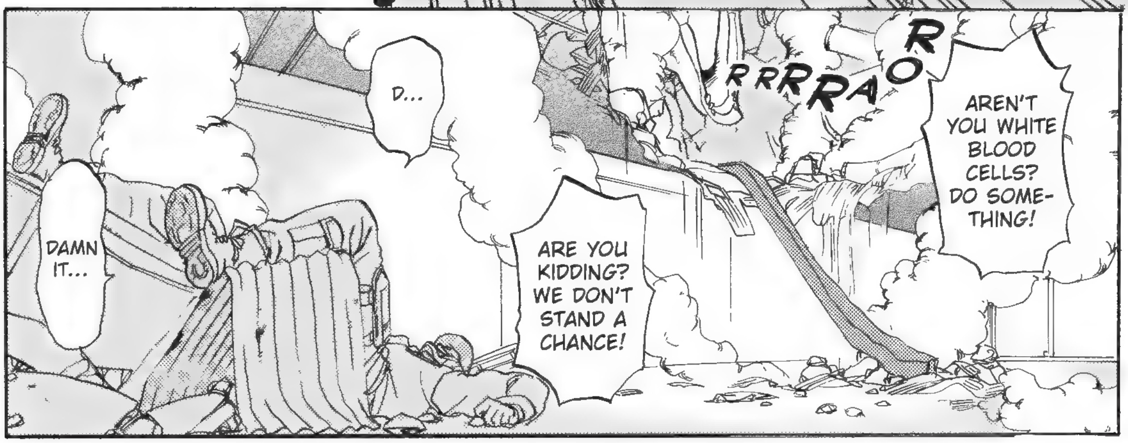

シュウウゥゥ
PSHHHH
THE STOMACH LINING...
シュウウゥゥ
PSHHHH
シュウウゥゥ
PSHHHH
I-I KNEW THAT SOMETHING WASN'T RIGHT.
THERE'S WAY TOO MUCH DAMAGE TO THE STOMACH LINING FOR THIS TO BE INFECTIVE FOOD POISONING.
WH-WHAT IS THIS?
AAAAUGH
WATCH OUT! THE HYDROCHLORIC ACID!
MORE ENEMIES?!

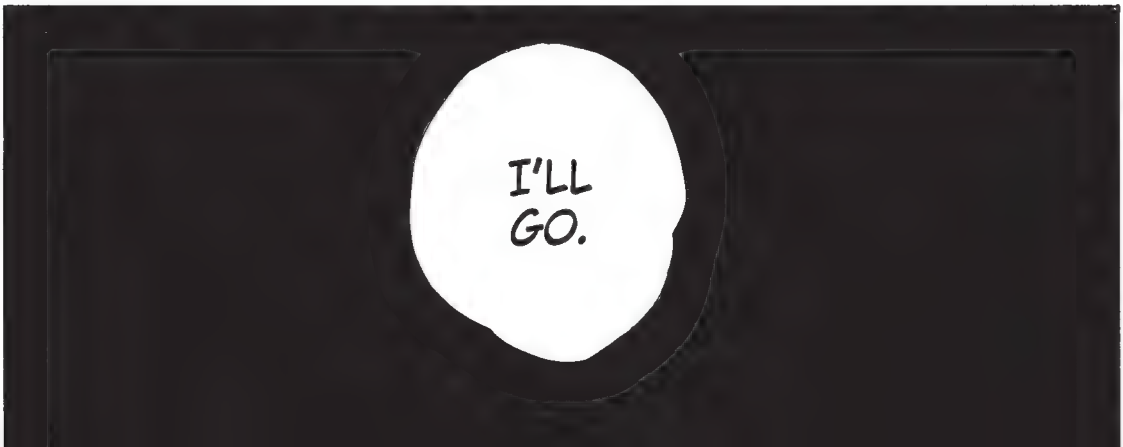

AAUGH!
ACID!
EEK!
バキバキ
CRACK CRACK
バキ
CRACK
WHAT'S THAT SOUND?
WHITE BLOOD CELL, EOSINOPHIL, ARE YOU ALL— WHOA!
BLOOD CELL
1146
THAT'S NO BACTERIUM—!
CRUMBLE
パラ‥

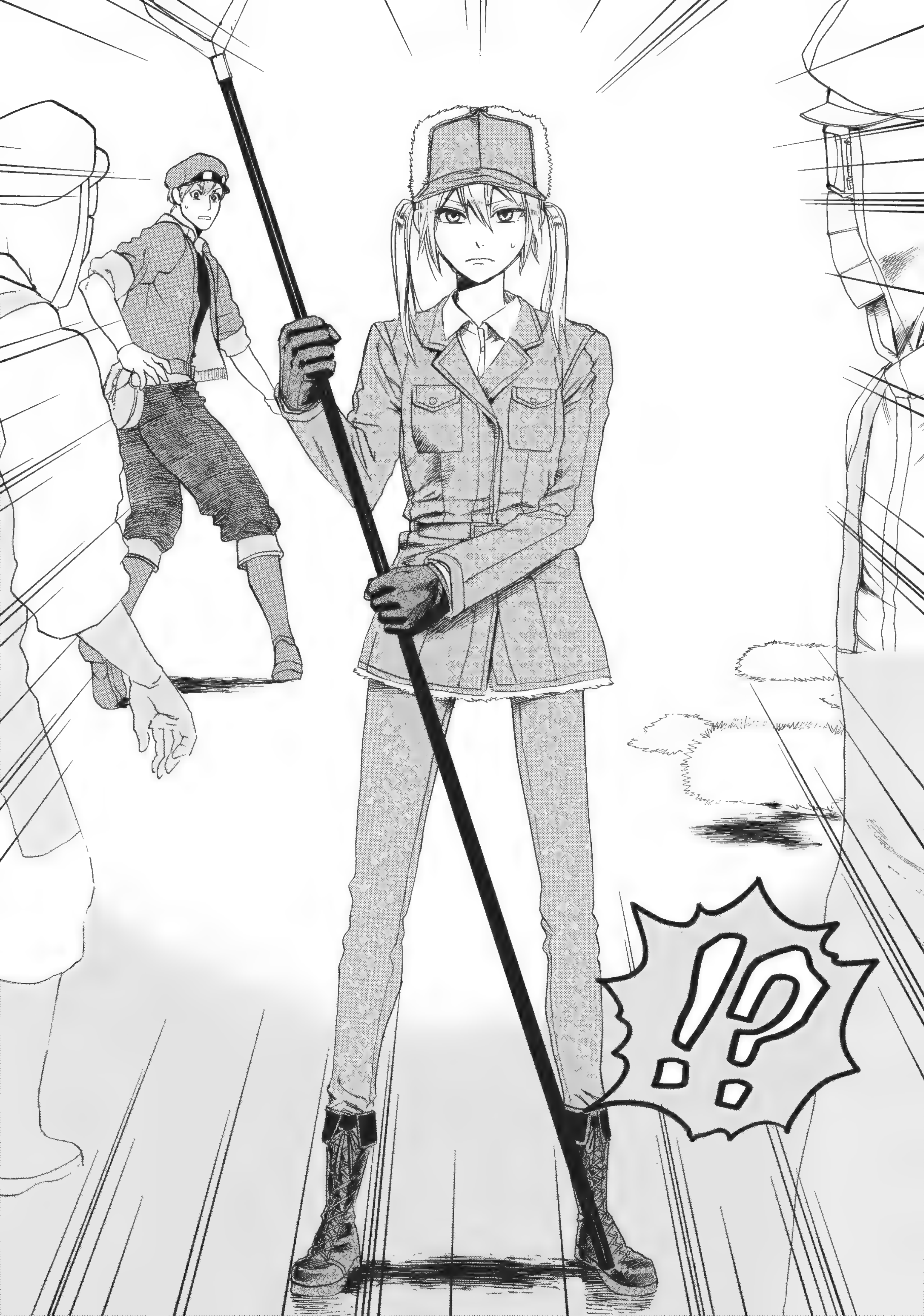

WHAM
RRRRIIIIIING
IT'S THE PARASITE ANISAKIS!
BAM
IT'S EATING THROUGH THE STOMACH LINING!
LOOK OUT! IT'S TRYING TO GET INSIDE THE BODY!
ダッ
DASH
S-STOP THAT THING, WHATEVER IT TAKES!
EVEN IF WE CAN'T BEAT IT, STAND YOUR GROUND!
ROOOARRRRRRRR
WHOOOSH
GAAAH!
OH NO! NO. 1146 WAS BLOWN AWAY JUST BY THAT ROAR!

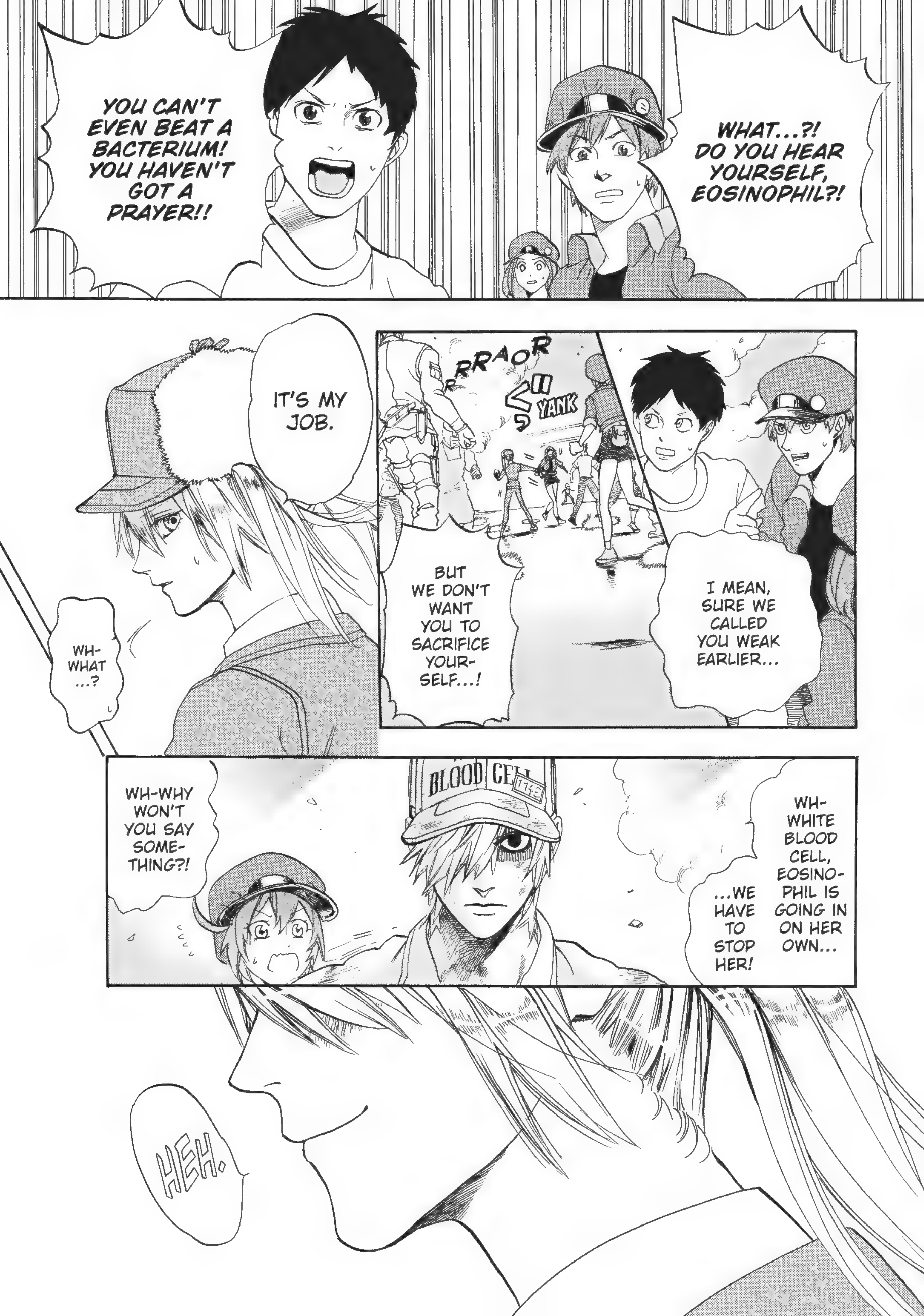
Anisakis
A parasitic nematode that lives in marine animals. Eating raw seafood containing anisakis can cause food poisoning (ansakiasis) with intense stomach pain and vomiting that is caused by invasion of the stomach or intestinal lining.

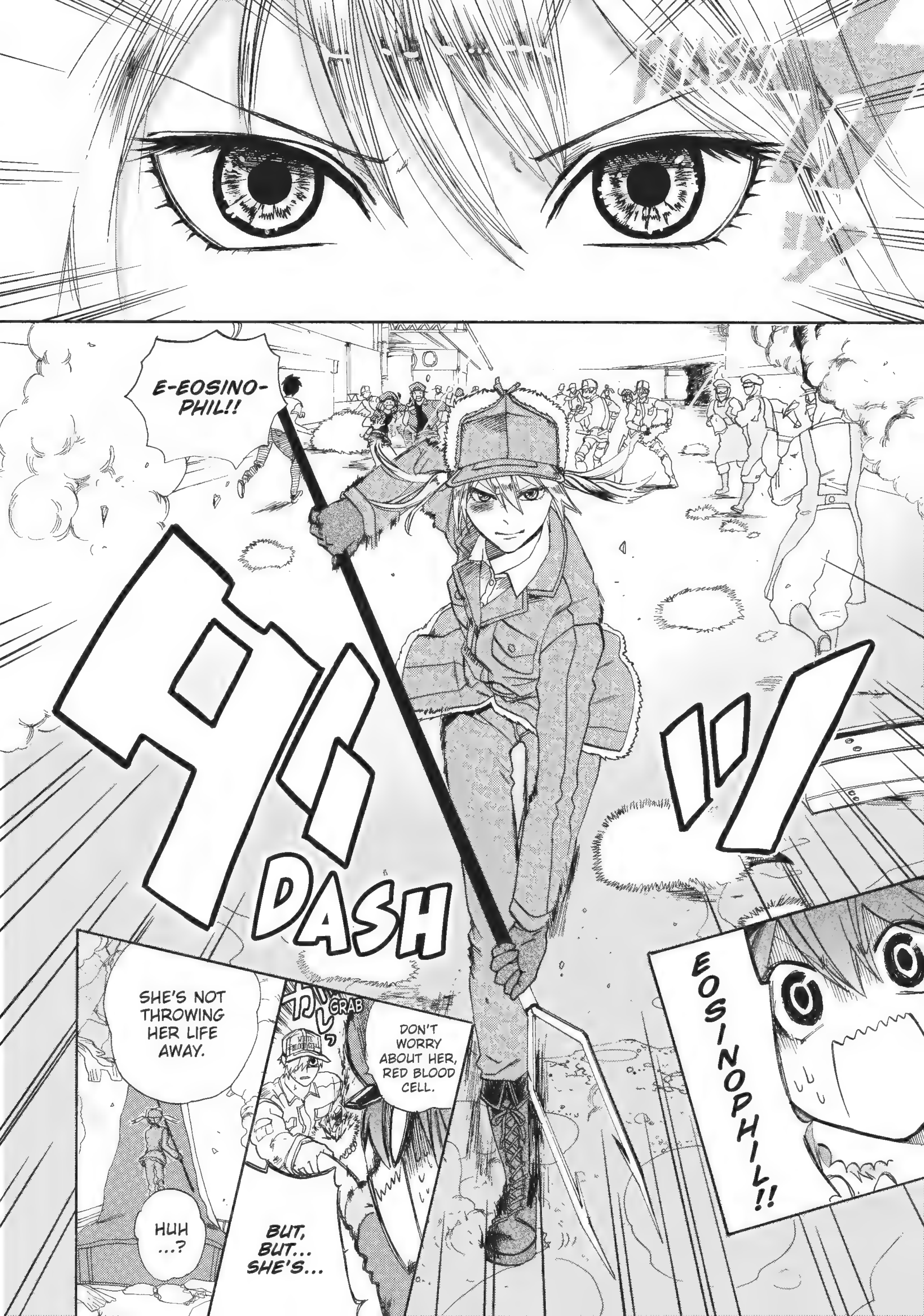

ROOARRRR
メキバキ
CRACK
CRACK
CRACK
CRACK
EEEE-EEEK!
AUGH, IT'S SO SCARY! SOMEONE STOP THAT THING!!

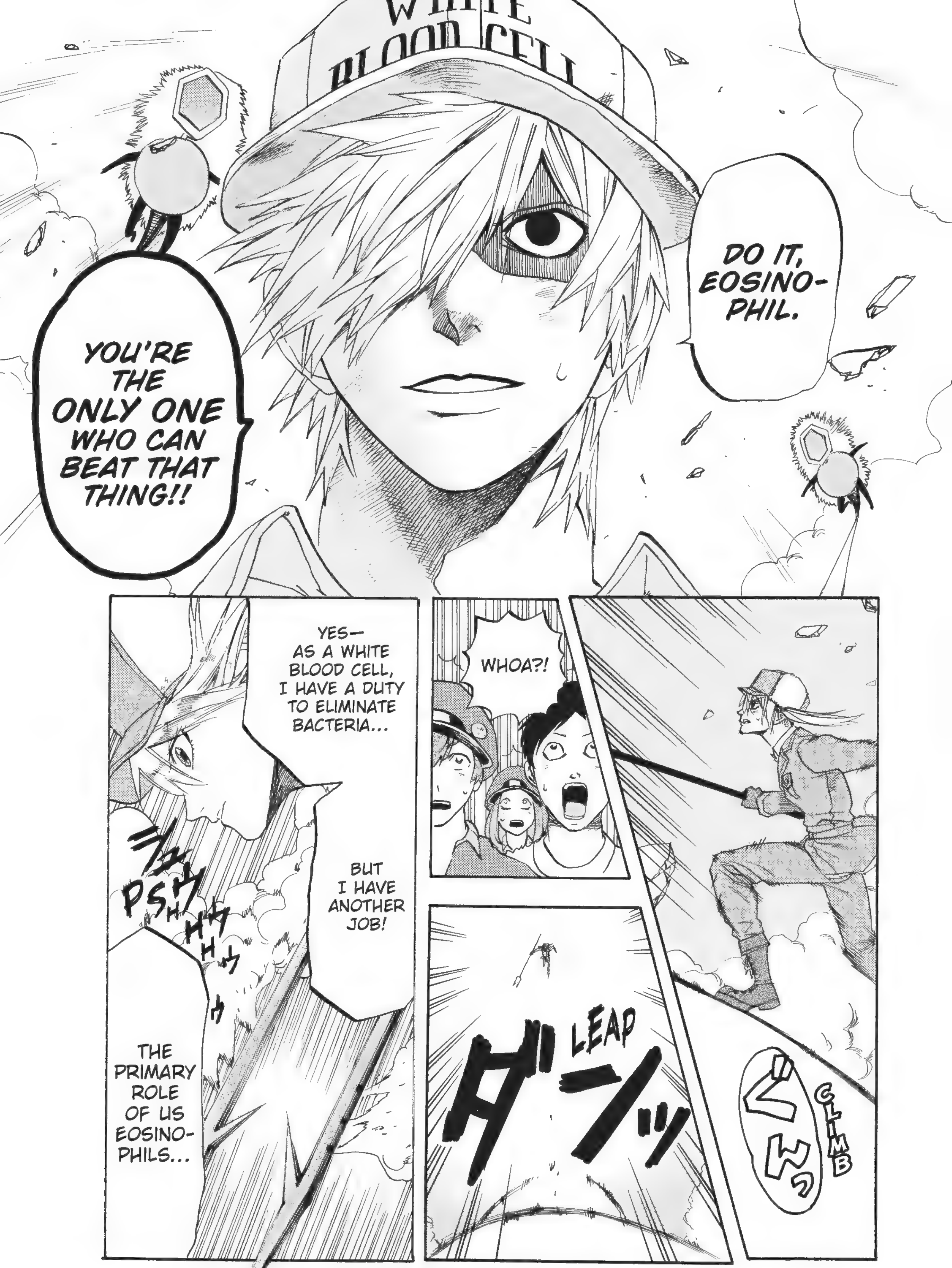

ROARRRRR
AREN'T YOU WHITE BLOOD CELLS? DO SOMETHING!
D...
ARE YOU KIDDING? WE DON'T STAND A CHANCE!
DAMN IT...

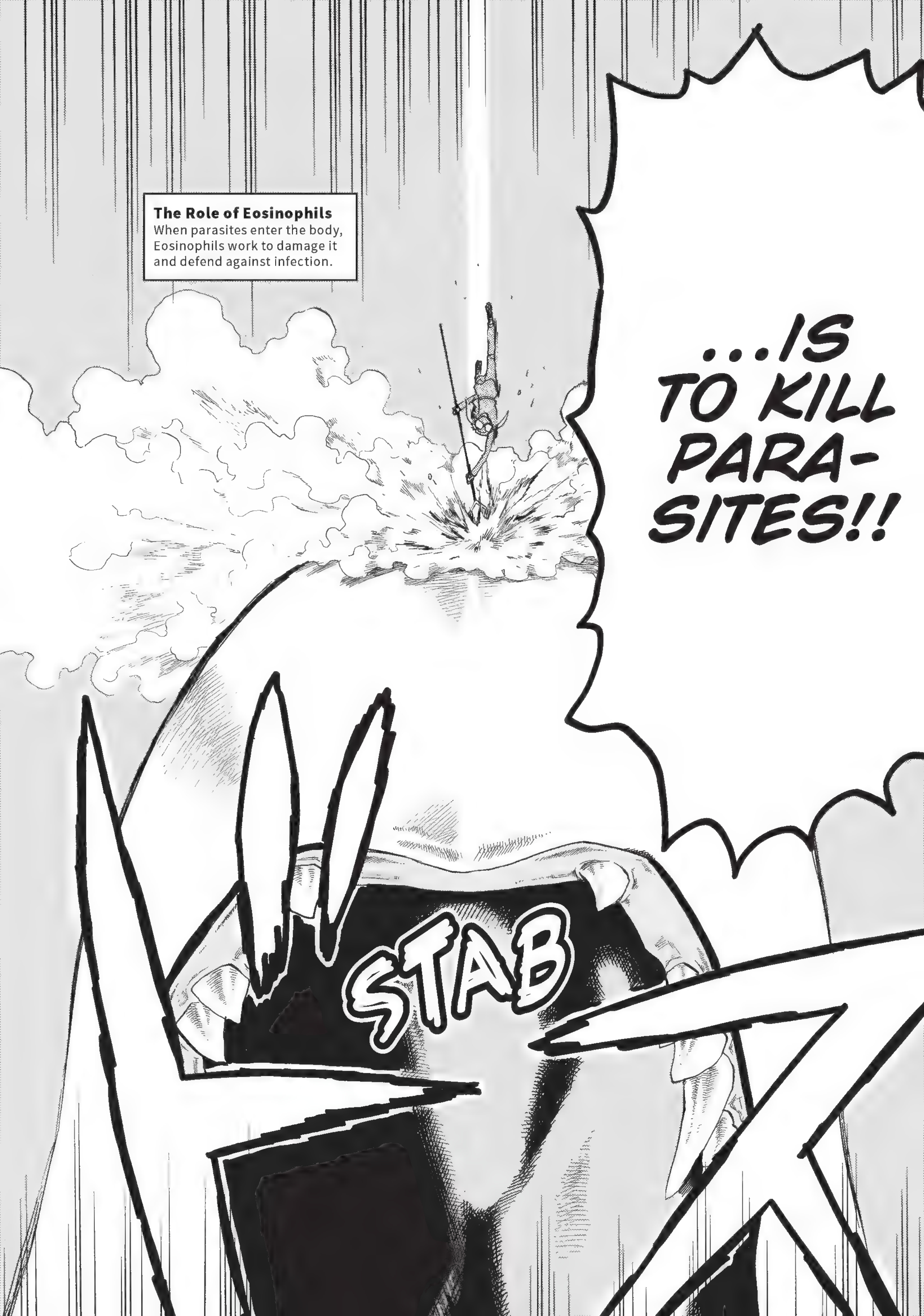

I'LL GO.




WHAT...?! DO YOU HEAR YOURSELF, EOSINOPHIL?!
YOU CAN'T EVEN BEAT A BACTERIUM! YOU HAVEN'T GOT A PRAYER!!
I MEAN, SURE WE CALLED YOU WEAK EARLIER...
YANK
RRRAOR
BUT WE DON'T WANT YOU TO SACRIFICE YOURSELF...!
IT'S MY JOB.
WH-WHAT...?
BLOOD CELL 1146
WH-WHITE BLOOD CELL, EOSINOPHIL IS GOING IN ON HER OWN...
...WE HAVE TO STOP HER!
WH-WHY WON'T YOU SAY SOMETHING?!
HEH.

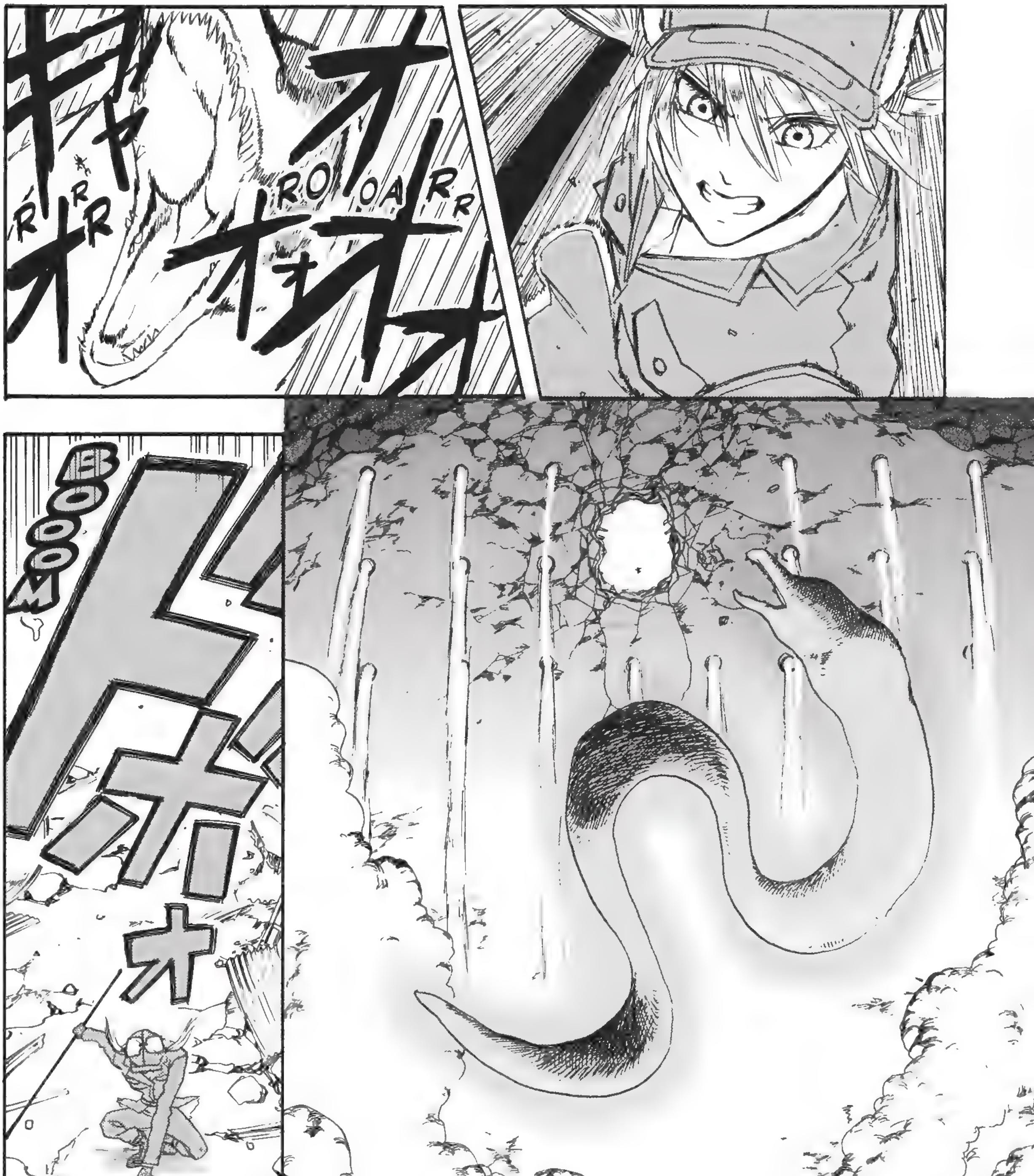

FLASH
E-EOSINO-PHIL!!
DASH
EOSINOPHIL!!
GRAB
WHITE BLOOD CELL
DON'T WORRY ABOUT HER, RED BLOOD CELL.
BUT, BUT... SHE'S...
SHE'S NOT THROWING HER LIFE AWAY.
HUH ...?

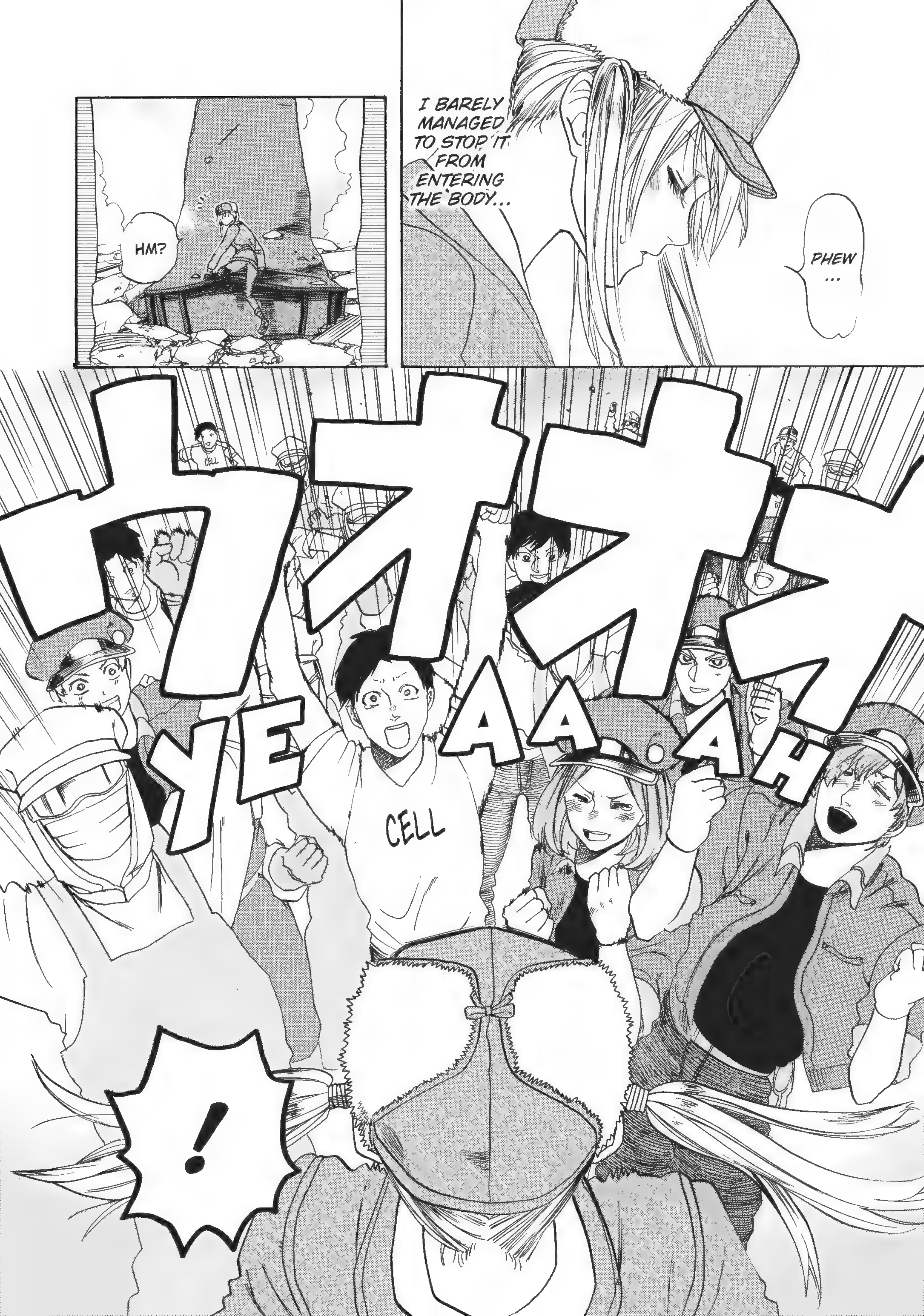

WHITE BLOOD CELL
DO IT, EOSINOPHIL.
YOU'RE THE ONLY ONE WHO CAN BEAT THAT THING!!
CLIMB
WHOA?!
LEAP
YES— AS A WHITE BLOOD CELL, I HAVE A DUTY TO ELIMINATE BACTERIA...
BUT I HAVE ANOTHER JOB!
PSHHH
THE PRIMARY ROLE OF US EOSINOPHILS...

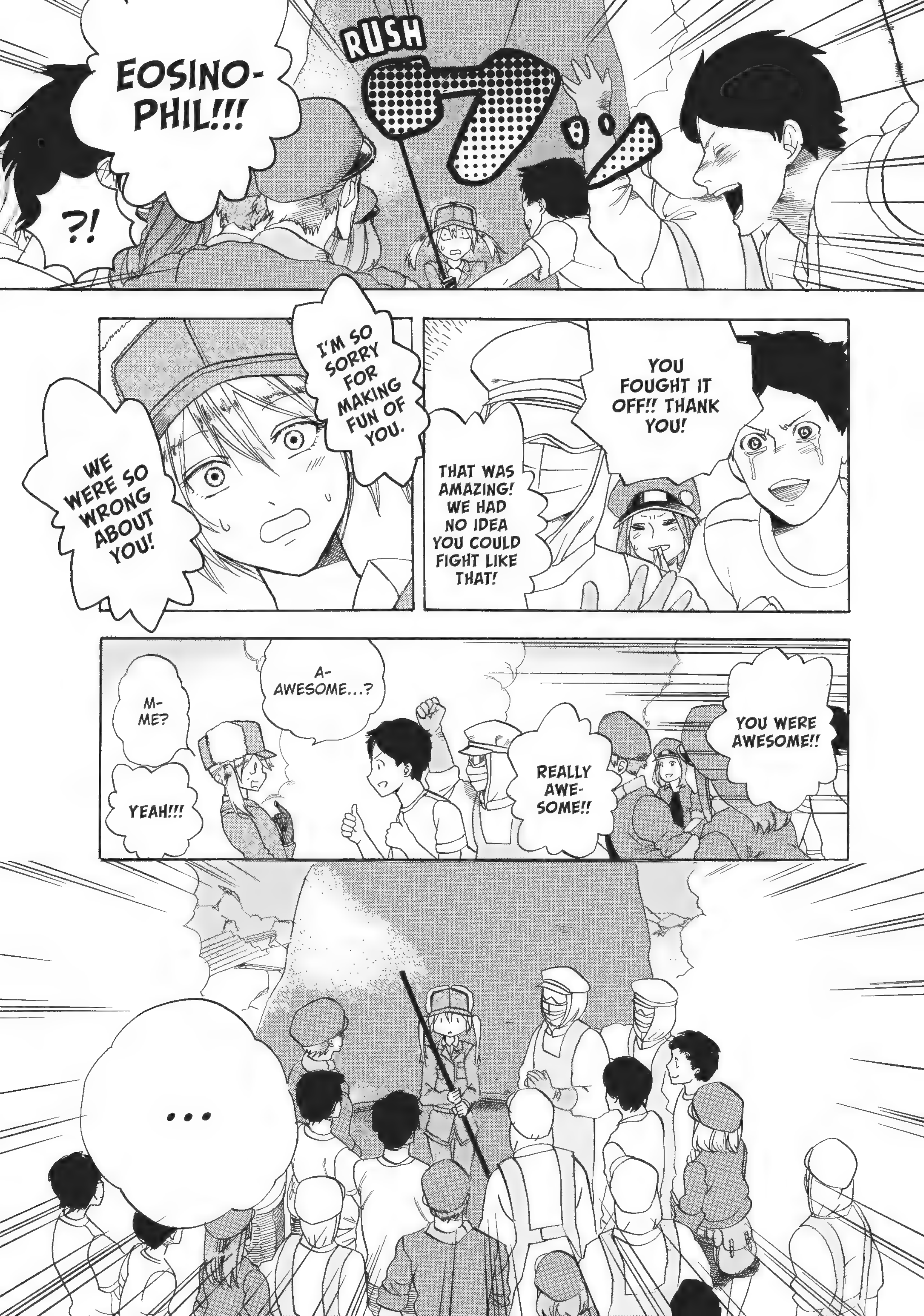


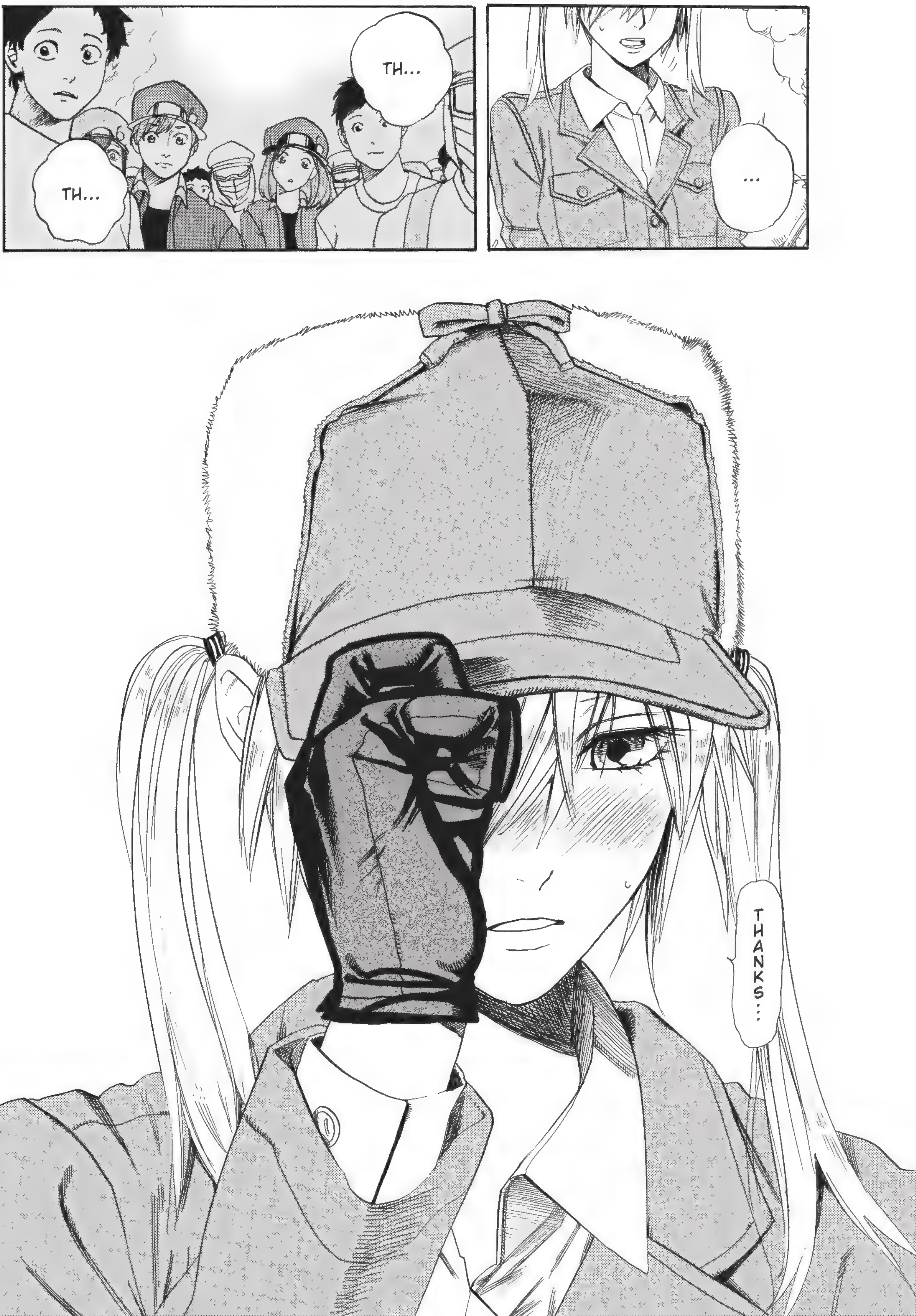
The Role of Eosinophils
When parasites enter the body, Eosinophils work to damage it and defend against infection.

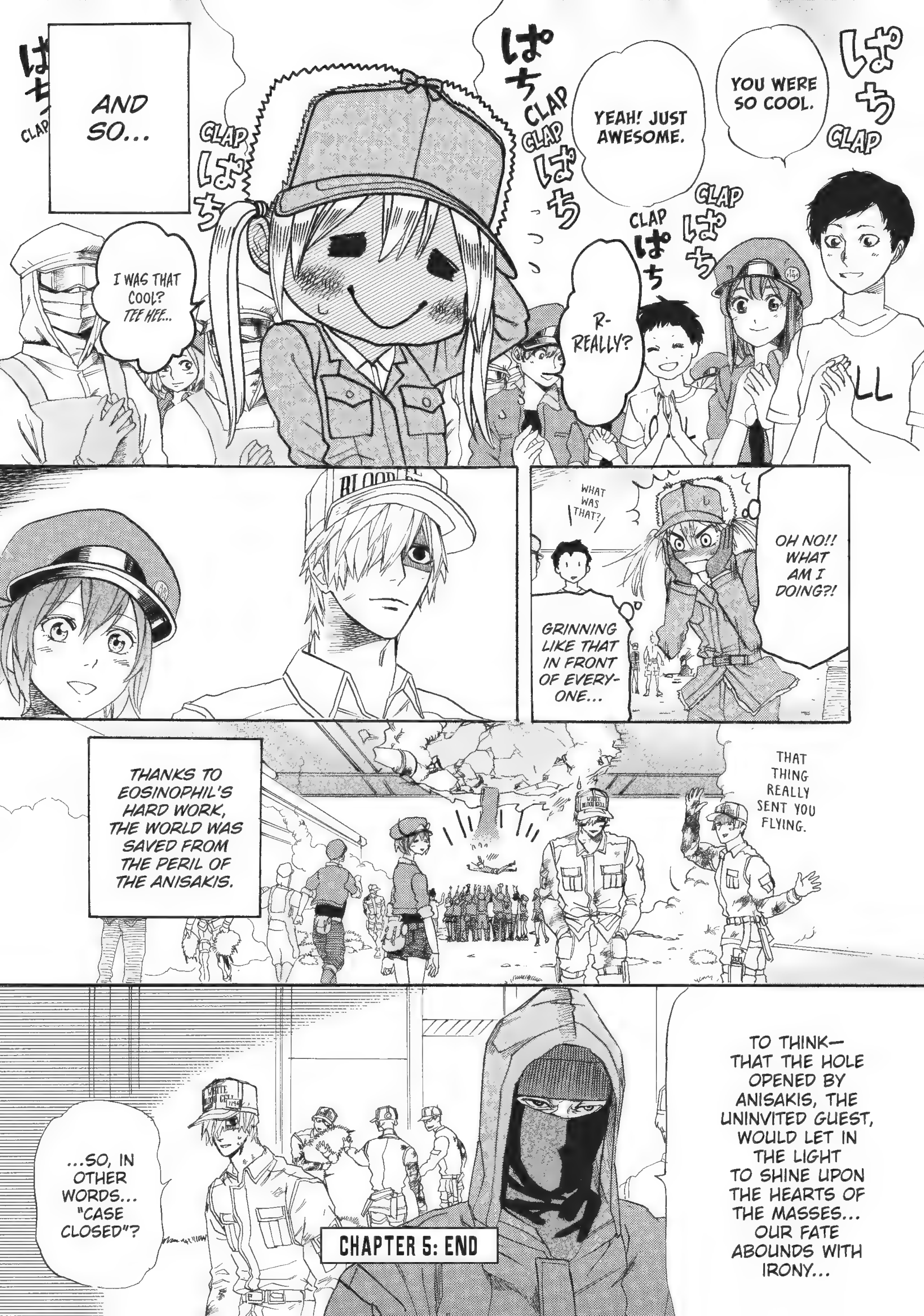
...IS TO KILL PARASITES!!
STAB


ギャオオォオオ
RRR
ROOARRR
ドボオン
BOOOOM


I BARELY MANAGED TO STOP IT FROM ENTERING THE BODY...
PHEW...
HM?
ウオオオ
YEAAAH
!

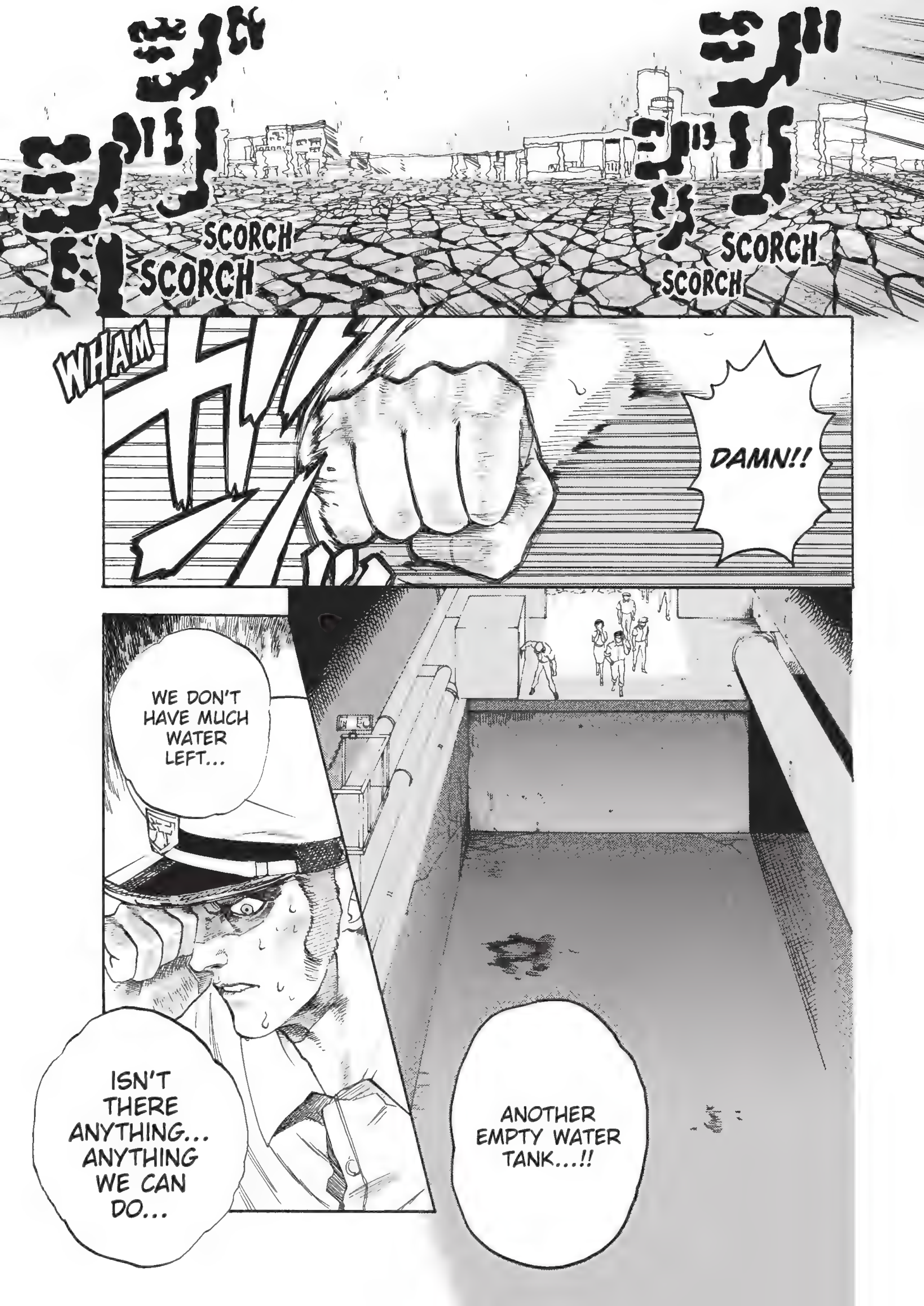

RUSH
EOSINO-PHIL!!!
?!
YOU FOUGHT IT OFF!! THANK YOU!
THAT WAS AMAZING! WE HAD NO IDEA YOU COULD FIGHT LIKE THAT!
I'M SO SORRY FOR MAKING FUN OF YOU.
WE WERE SO WRONG ABOUT YOU!
YOU WERE AWESOME!!
REALLY AWE-SOME!!
A- AWESOME...?
M- ME?
YEAH!!!
...

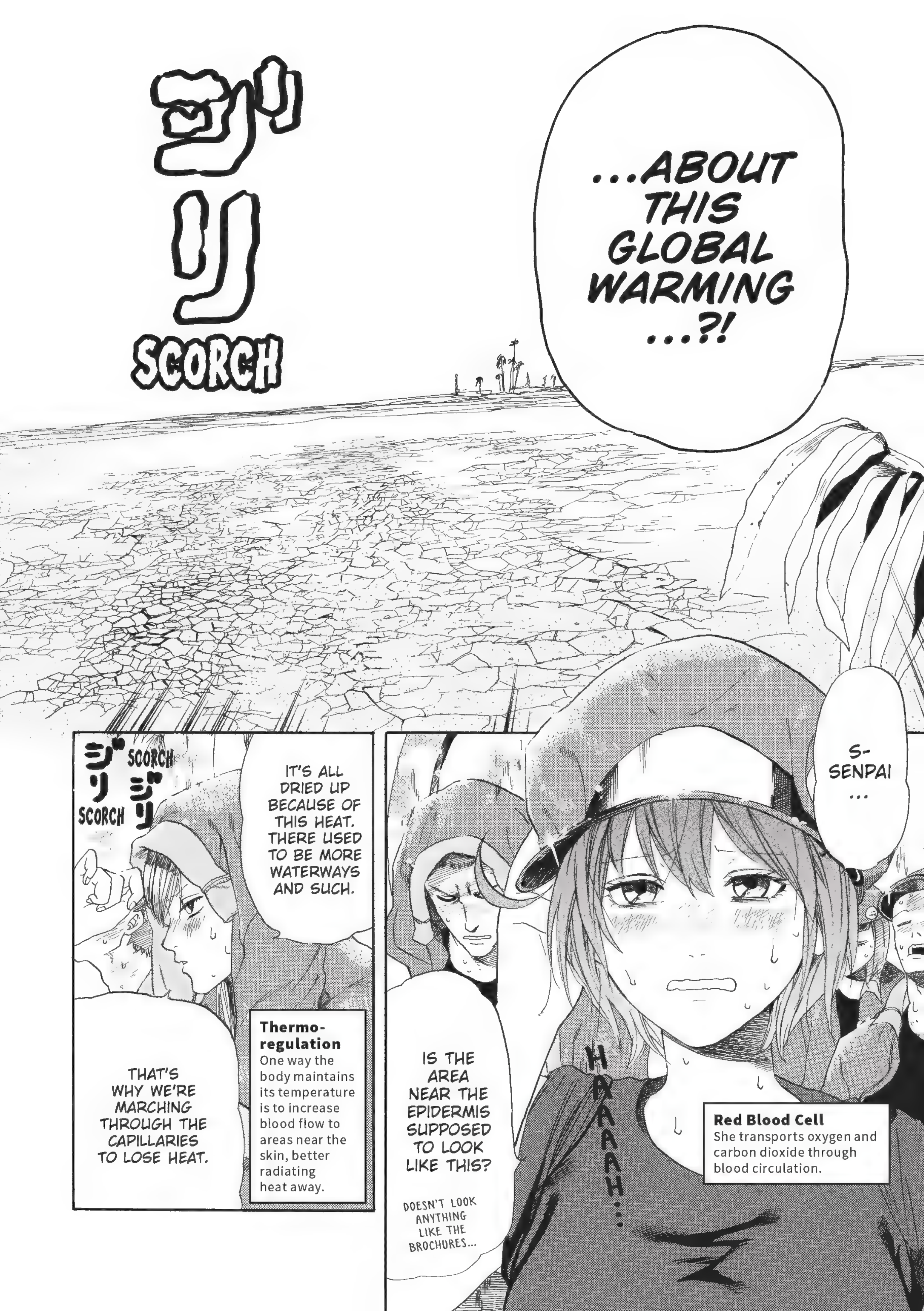

...
TH...
TH...
THANKS...


AND SO...
ぱち CLAP
YOU WERE SO COOL.
ぱち CLAP
YEAH! JUST AWESOME.
ぱち CLAP
CLAP ぱち
CLAP ぱち
CLAP ぱち
R-REALLY?
CLAP ぱち
I WAS THAT COOL? TEE HEE...
ぱち CLAP
OH NO!! WHAT AM I DOING?!
WHAT WAS THAT?
GRINNING LIKE THAT IN FRONT OF EVERYONE...
THAT THING REALLY SENT YOU FLYING.
THANKS TO EOSINOPHIL'S HARD WORK, THE WORLD WAS SAVED FROM THE PERIL OF THE ANISAKIS.
TO THINK— THAT THE HOLE OPENED BY ANISAKIS, THE UNINVITED GUEST, WOULD LET IN THE LIGHT TO SHINE UPON THE HEARTS OF THE MASSES... OUR FATE ABOUNDS WITH IRONY...
...SO, IN OTHER WORDS... "CASE CLOSED"?
CHAPTER 5: END

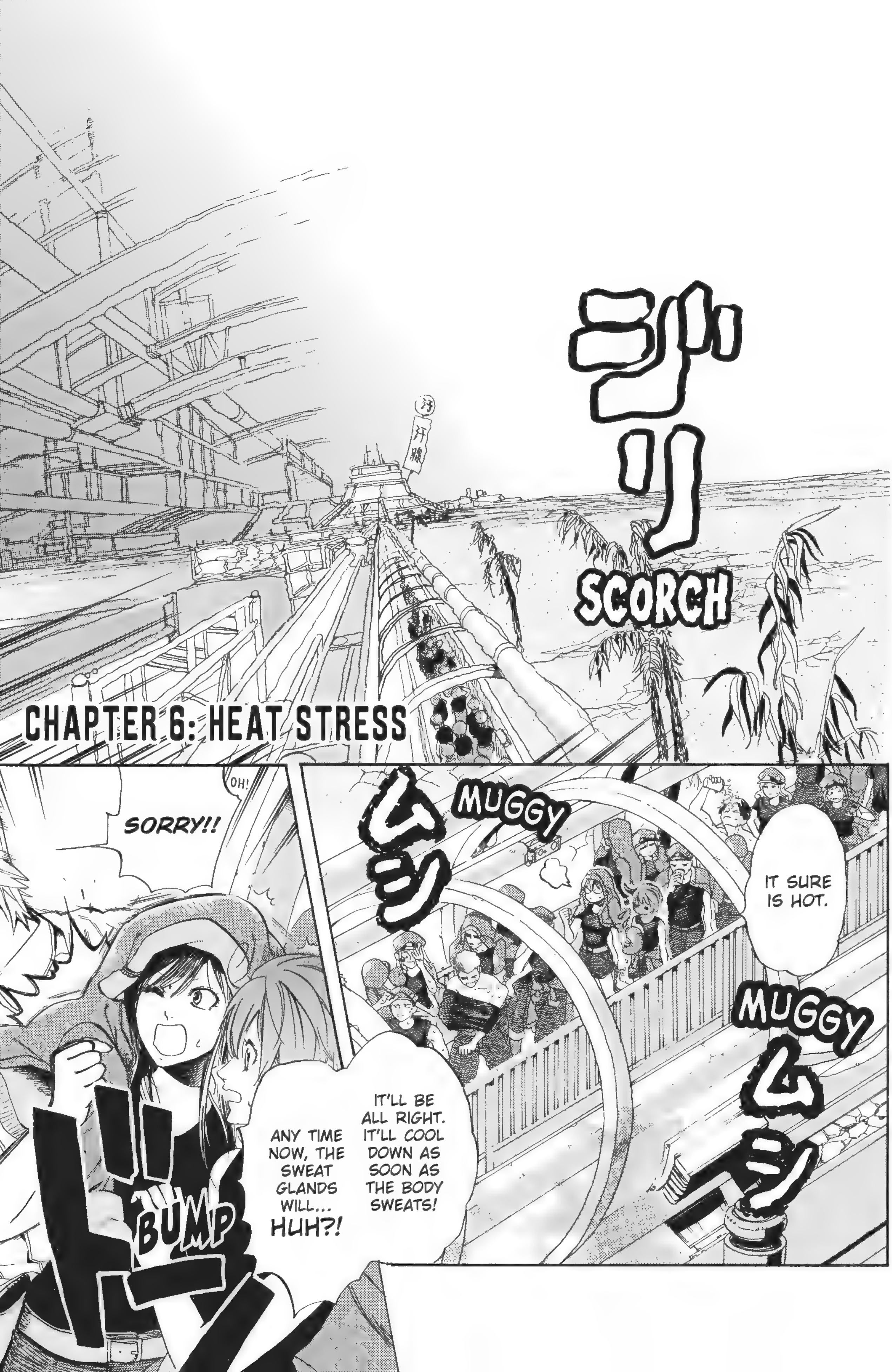
Cells at Work!

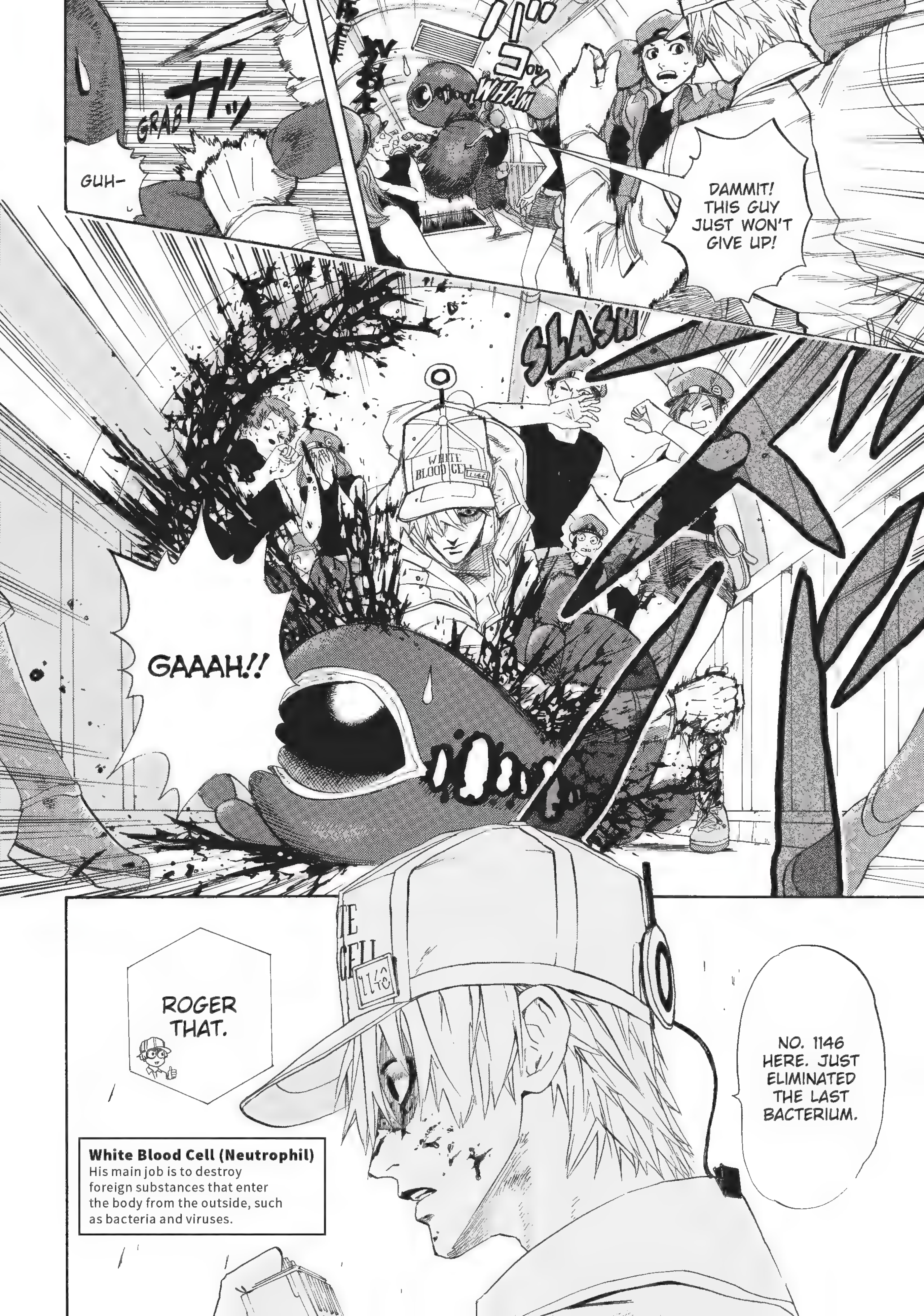
はたらく細胞


SCORCH
SCORCH
SCORCH
SCORCH
WHAM
DAMN!!
ANOTHER EMPTY WATER TANK...!!
WE DON'T HAVE MUCH WATER LEFT...
ISN'T THERE ANYTHING... ANYTHING WE CAN DO...

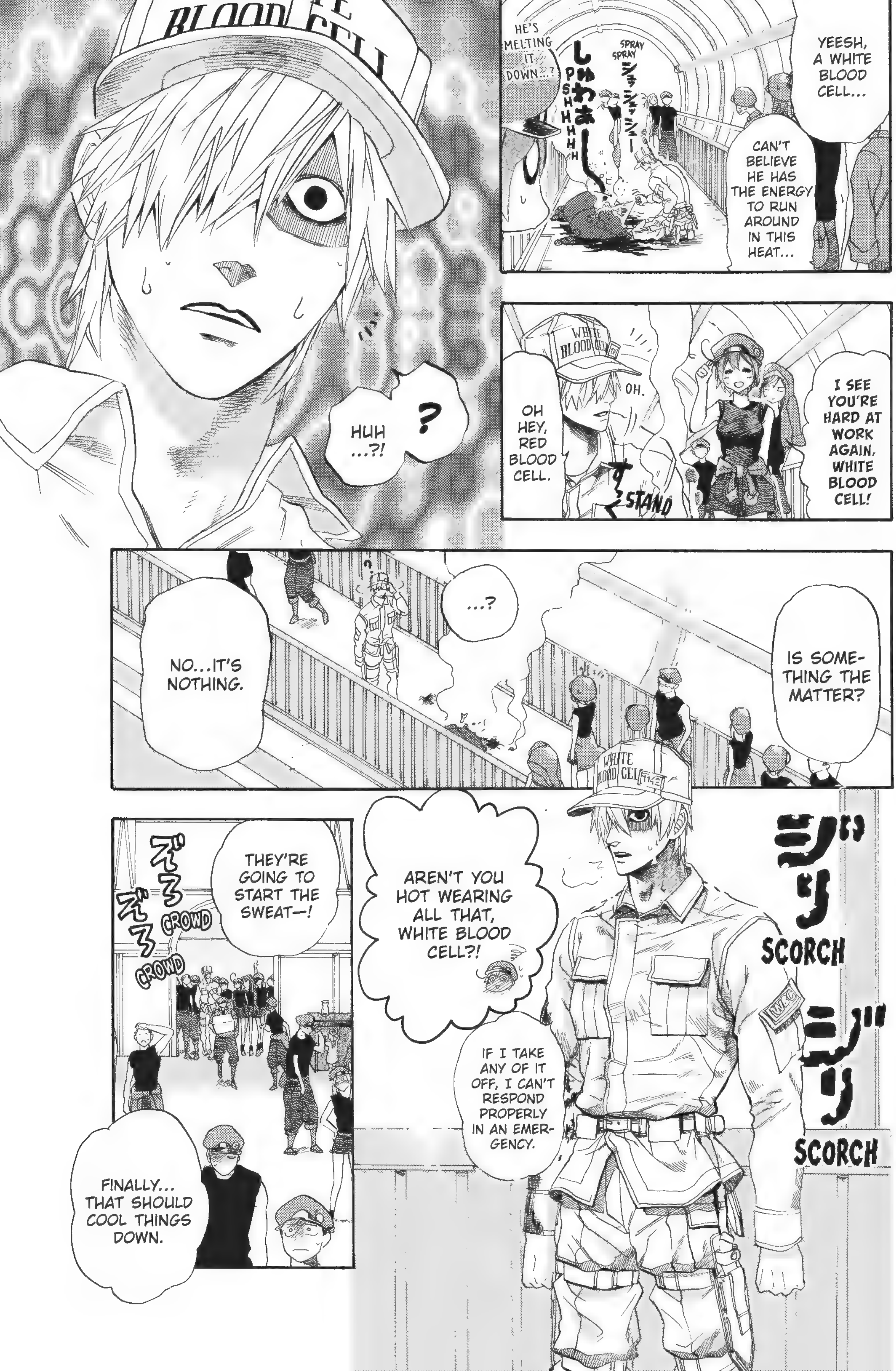

ジリ
SCORCH
...ABOUT THIS GLOBAL WARMING...?!
S-SENPAI...
Red Blood Cell
She transports oxygen and carbon dioxide through blood circulation.
HAAAAH...
IS THE AREA NEAR THE EPIDERMIS SUPPOSED TO LOOK LIKE THIS?
DOESN'T LOOK ANYTHING LIKE THE BROCHURES...
IT'S ALL DRIED UP BECAUSE OF THIS HEAT. THERE USED TO BE MORE WATERWAYS AND SUCH.
Thermo-regulation
One way the body maintains its temperature is to increase blood flow to areas near the skin, better radiating heat away.
THAT'S WHY WE'RE MARCHING THROUGH THE CAPILLARIES TO LOSE HEAT.
ジリ SCORCH
ジリ SCORCH

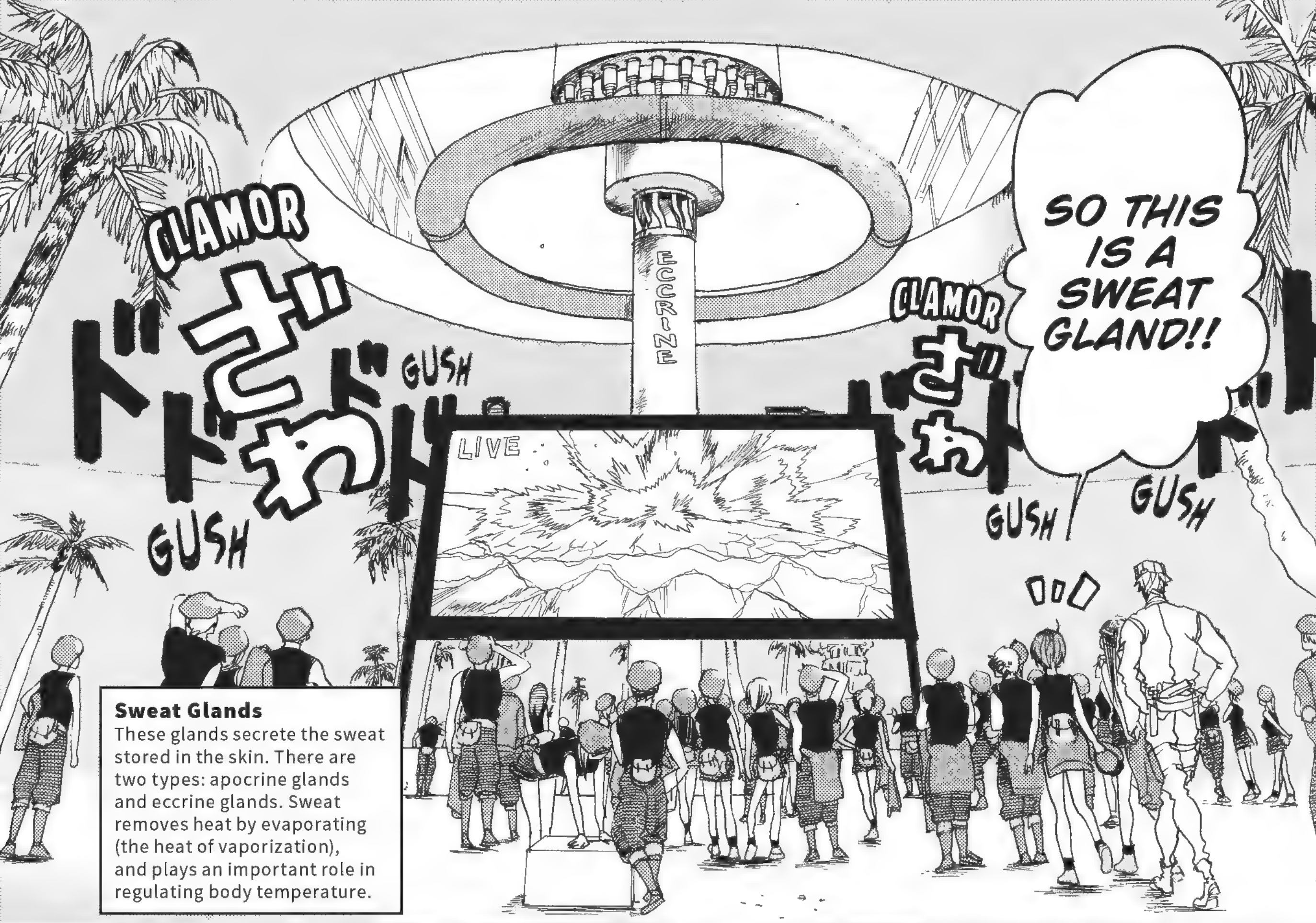
CHAPTER 6: HEAT STRESS


汗腺
ジリ
SCORCH
ムシ
MUGGY
IT SURE IS HOT.
MUGGY
ムシ
IT'LL BE ALL RIGHT. IT'LL COOL DOWN AS SOON AS THE BODY SWEATS!
OH!
SORRY!!
ANY TIME NOW, THE SWEAT GLANDS WILL... HUH?!
ド
BUMP

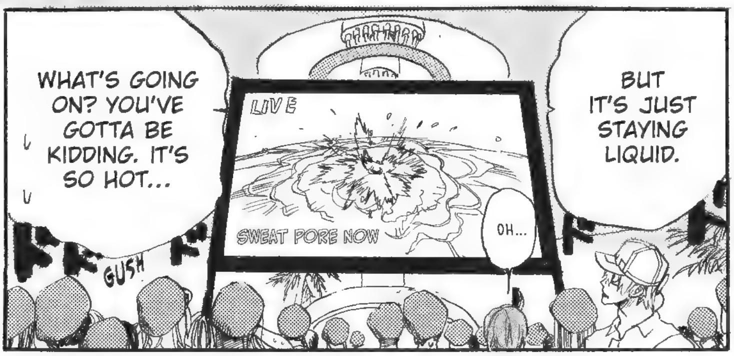

DAMMIT! THIS GUY JUST WON'T GIVE UP!
WHAM
GRAB
GUH-
SLASH
WHITE BLOOD CELL 1146
GAAAH!!
NO. 1146 HERE. JUST ELIMINATED THE LAST BACTERIUM.
ROGER THAT.

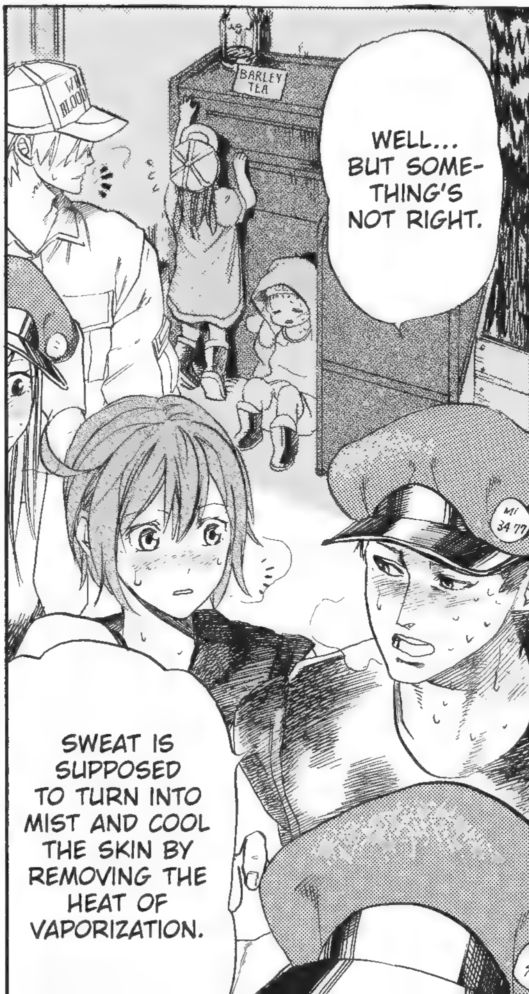
White Blood Cell (Neutrophil)
His main job is to destroy foreign substances that enter the body from the outside, such as bacteria and viruses.

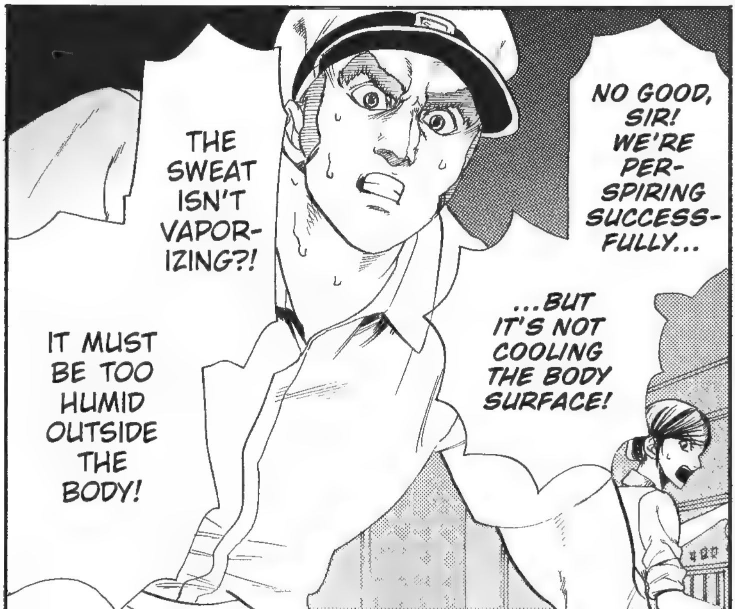

YEESH, A WHITE BLOOD CELL...
CAN'T BELIEVE HE HAS THE ENERGY TO RUN AROUND IN THIS HEAT...
シュシュシュー
SPRAY SPRAY
しゅわぁー
PSHHHHHH
HE'S MELTING IT DOWN...?
WHITE BLOOD CELL
HUH...?!
?
I SEE YOU'RE HARD AT WORK AGAIN, WHITE BLOOD CELL!
OH.
OH HEY, RED BLOOD CELL.
すっく
STAND
IS SOME-THING THE MATTER?
...?
NO...IT'S NOTHING.
WHITE BLOOD CELL
ジリ
SCORCH
ジリ
SCORCH
AREN'T YOU HOT WEARING ALL THAT, WHITE BLOOD CELL?!
IF I TAKE ANY OF IT OFF, I CAN'T RESPOND PROPERLY IN AN EMER-GENCY.
THEY'RE GOING TO START THE SWEAT—!
ぞろぞろ
CROWD
CROWD
FINALLY... THAT SHOULD COOL THINGS DOWN.

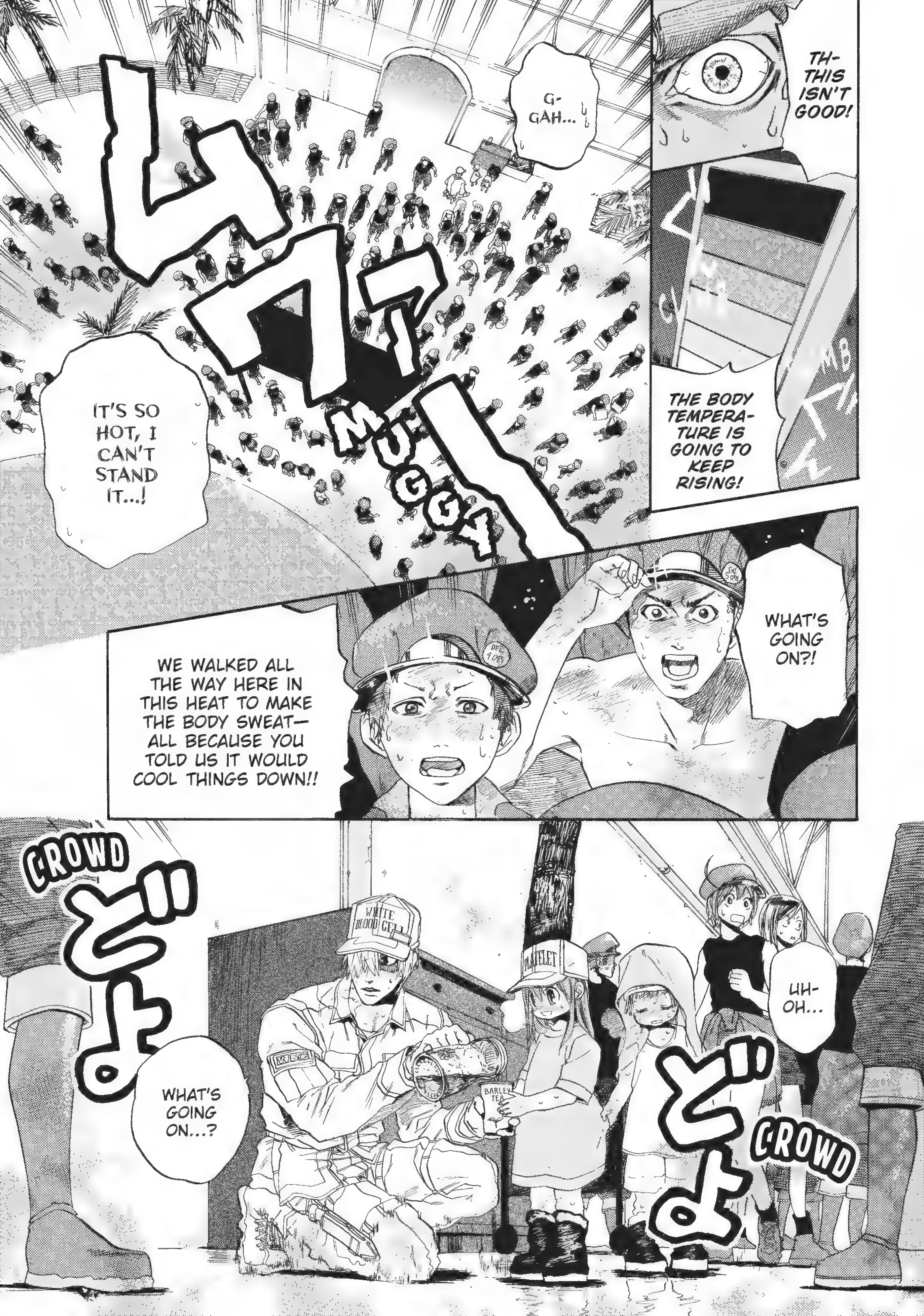

CLAMOR
ざわ
ドドド
GUSH
GUSH
ECCRINE
LIVE
CLAMOR
ざわ
GUSH
GUSH
ドド
SO THIS IS A SWEAT GLAND!!

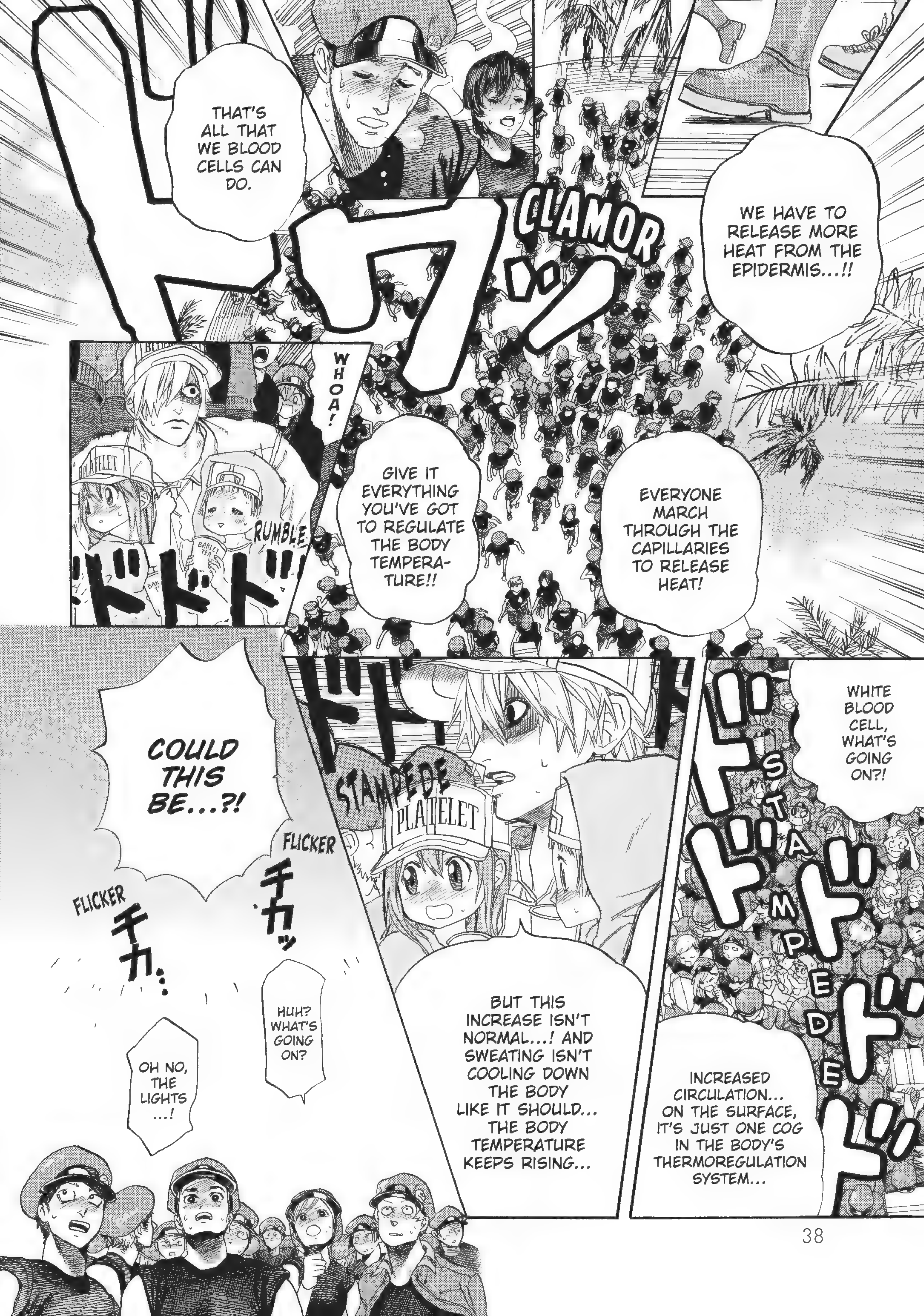
Sweat Glands
These glands secrete the sweat stored in the skin. There are two types: apocrine glands and eccrine glands. Sweat removes heat by evaporating (the heat of vaporization), and plays an important role in regulating body temperature.


WHAT'S GOING ON? YOU'VE GOTTA BE KIDDING. IT'S SO HOT...
LIVE
SWEAT PORE NOW
GUSH
ドド
BUT IT'S JUST STAYING LIQUID.
OH...

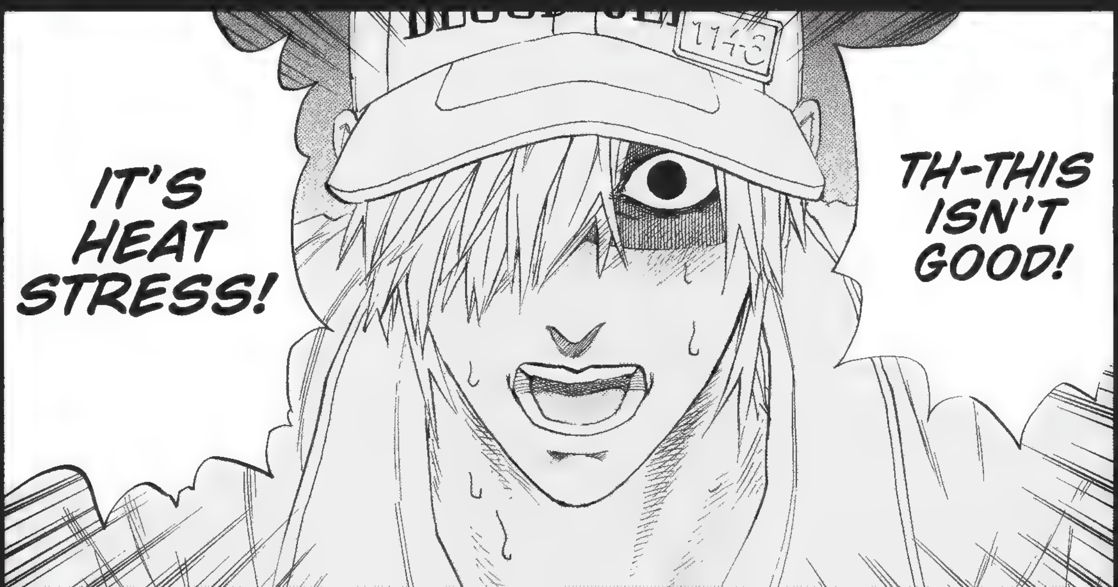

BARLEY TEA
WHITE BLOOD
WELL... BUT SOMETHING'S NOT RIGHT.
MI 3477
SWEAT IS SUPPOSED TO TURN INTO MIST AND COOL THE SKIN BY REMOVING THE HEAT OF VAPORIZATION.

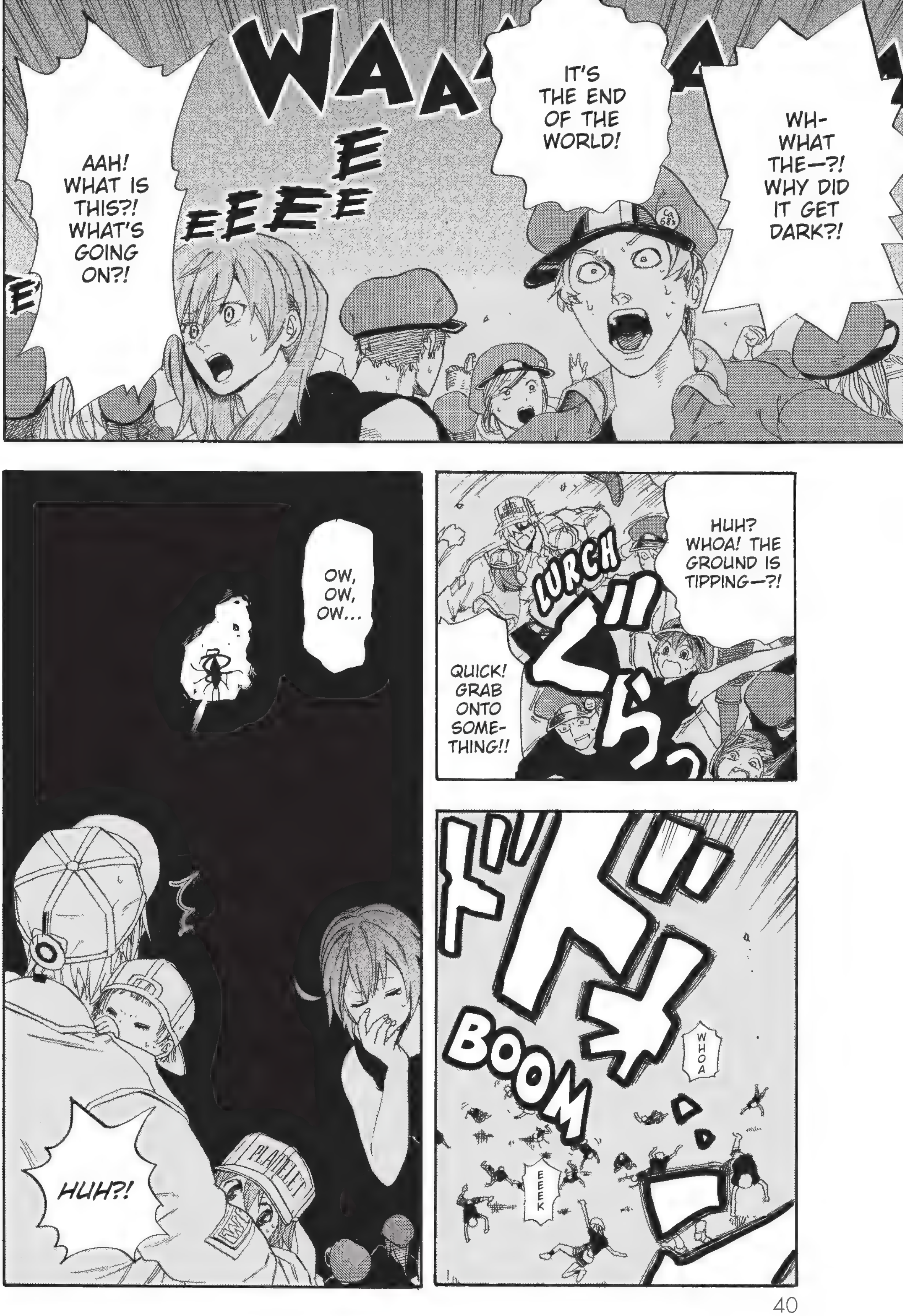

THE SWEAT ISN'T VAPORIZING?!
NO GOOD, SIR! WE'RE PERSPIRING SUCCESSFULLY...
...BUT IT'S NOT COOLING THE BODY SURFACE!
IT MUST BE TOO HUMID OUTSIDE THE BODY!

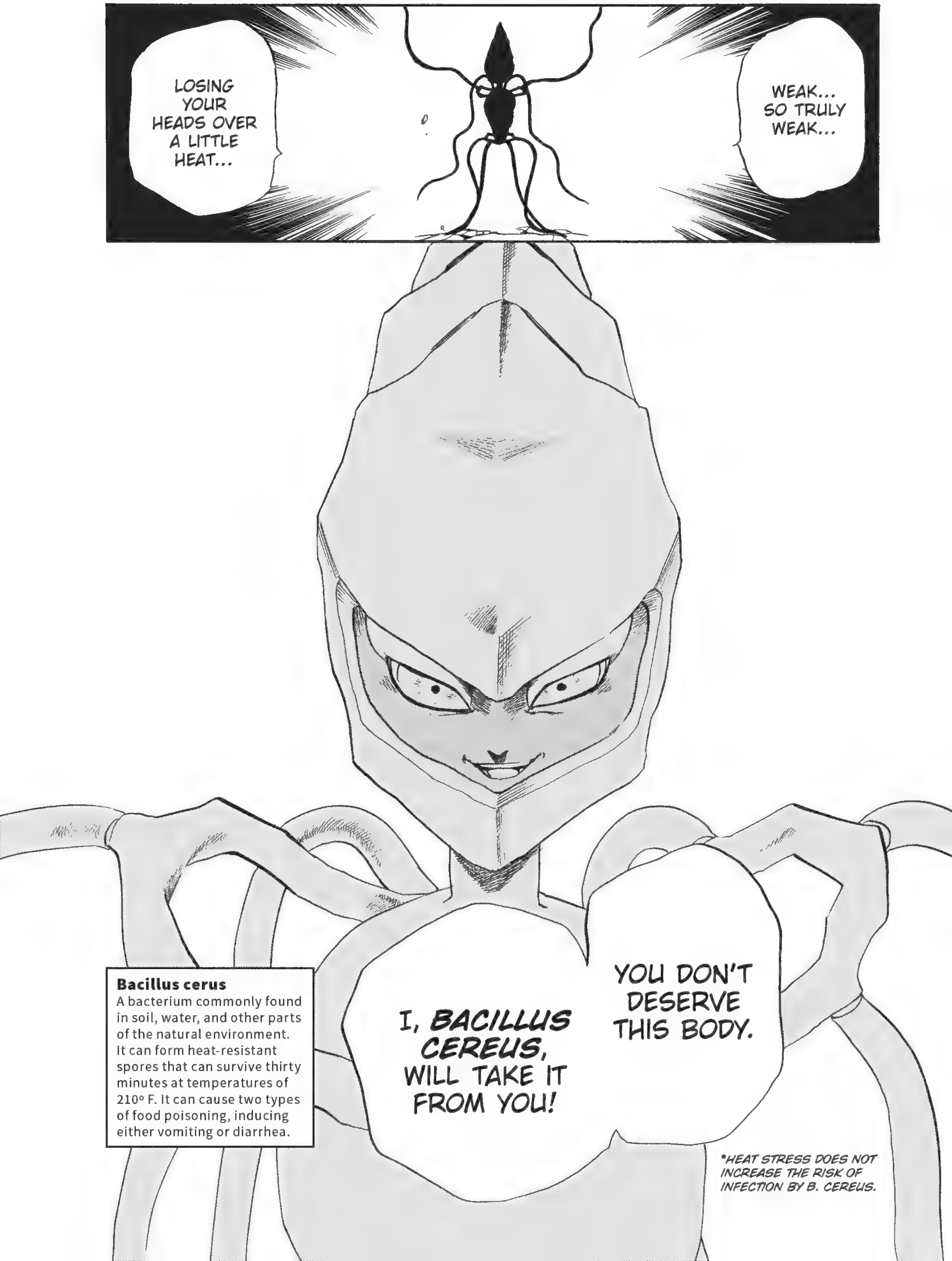

TH-THIS ISN'T GOOD!
THE BODY TEMPERATURE IS GOING TO KEEP RISING!
G-GAH...
ムワァ
MUGGY
IT'S SO HOT, I CAN'T STAND IT...!
WHAT'S GOING ON?!
WE WALKED ALL THE WAY HERE IN THIS HEAT TO MAKE THE BODY SWEAT—ALL BECAUSE YOU TOLD US IT WOULD COOL THINGS DOWN!!
UH-OH...
どよ
CROWD
WHITE BLOOD CELL
PLATELET
WBC
BARLEY TEA
WHAT'S GOING ON...?
どよ
CROWD


WE HAVE TO RELEASE MORE HEAT FROM THE EPIDERMIS...!!
THAT'S ALL THAT WE BLOOD CELLS CAN DO.
CLAMOR
EVERYONE MARCH THROUGH THE CAPILLARIES TO RELEASE HEAT!
GIVE IT EVERYTHING YOU'VE GOT TO REGULATE THE BODY TEMPERATURE!!
WHOA!
PLATELET
BARLEY TEA
RUMBLE
WHITE BLOOD CELL, WHAT'S GOING ON?!
STAMPEDE
INCREASED CIRCULATION... ON THE SURFACE, IT'S JUST ONE COG IN THE BODY'S THERMOREGULATION SYSTEM...
STAMPEDE
PLATELET
BUT THIS INCREASE ISN'T NORMAL...! AND SWEATING ISN'T COOLING DOWN THE BODY LIKE IT SHOULD... THE BODY TEMPERATURE KEEPS RISING...
COULD THIS BE...?!
FLICKER
FLICKER
HUH? WHAT'S GOING ON?
OH NO, THE LIGHTS...!

Heat Stress
A general term for health disorders resulting from the malfunction of thermoregulatory processes, or from the breakdown in the balance of water or electrolytes in the body. It is divided into three levels based on severity. Heat syncope, characterized by symptoms such as dizziness, lightheadedness and numbness in the lips, is considered the lightest level of heat stress. It is caused when blood vessels near the skin dilate to increase blood flow, leading to low blood pressure and reduced circulation to the brain.

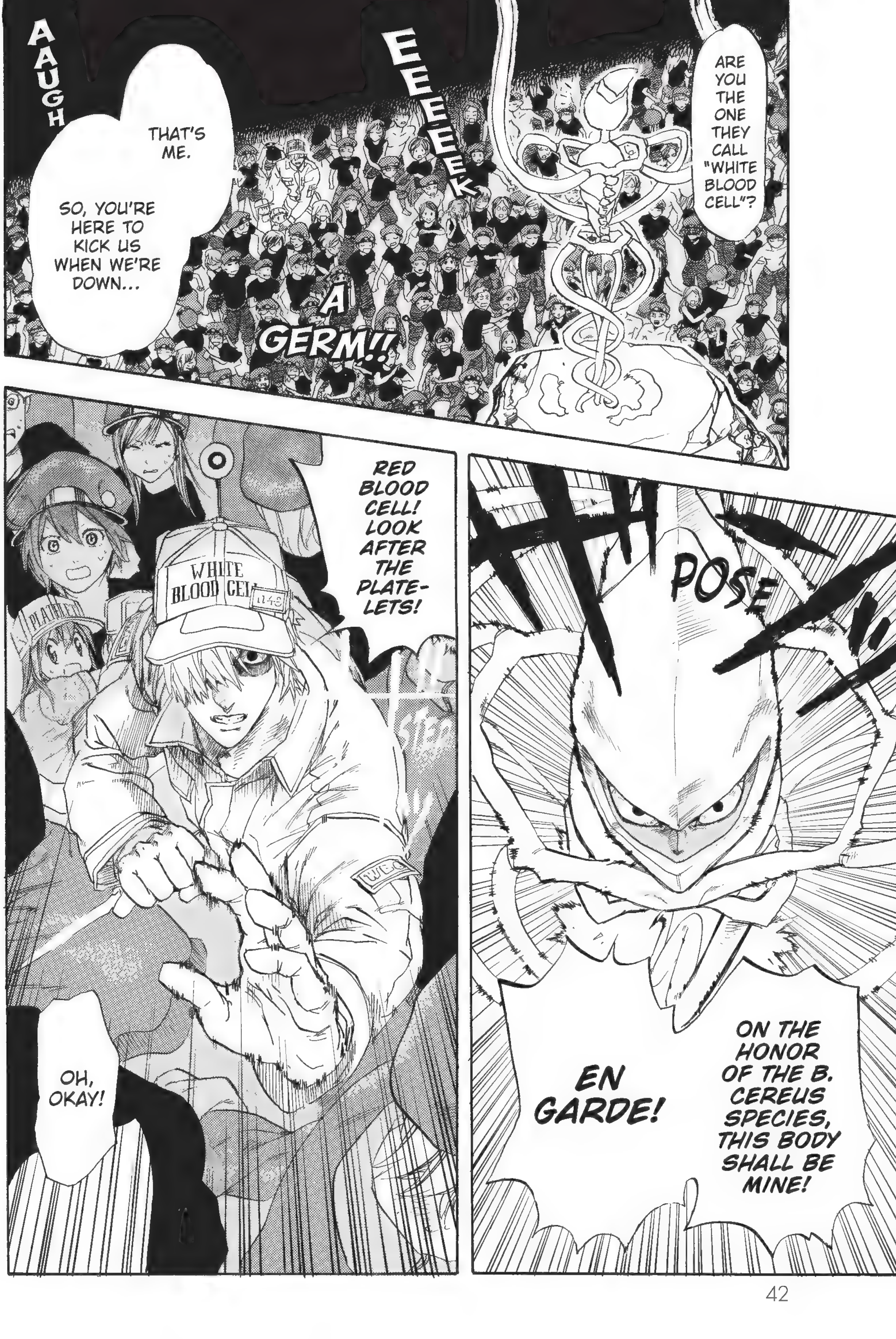

TH-THIS ISN'T GOOD!
IT'S HEAT STRESS!

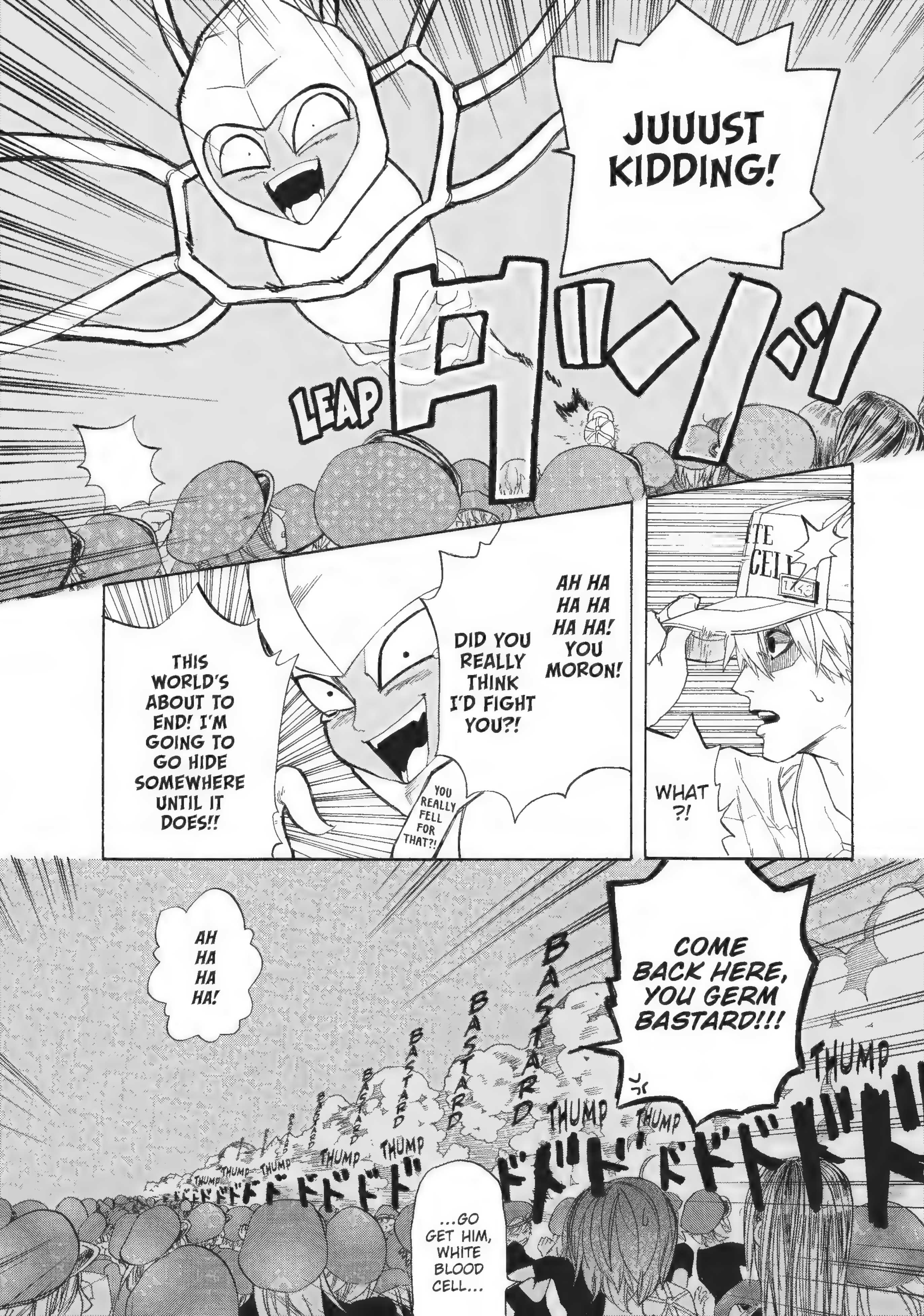

WAAAAA
WH- WHAT THE—?! WHY DID IT GET DARK?!
IT'S THE END OF THE WORLD!
EEEEEEE
AAH! WHAT IS THIS?! WHAT'S GOING ON?!
HUH? WHOA! THE GROUND IS TIPPING—?!
LURCH
ぐらっ
QUICK! GRAB ONTO SOME-THING!!
ドドド
BOOM
WHOA
EEEK
OW, OW, OW...
PLATELET
HUH?!

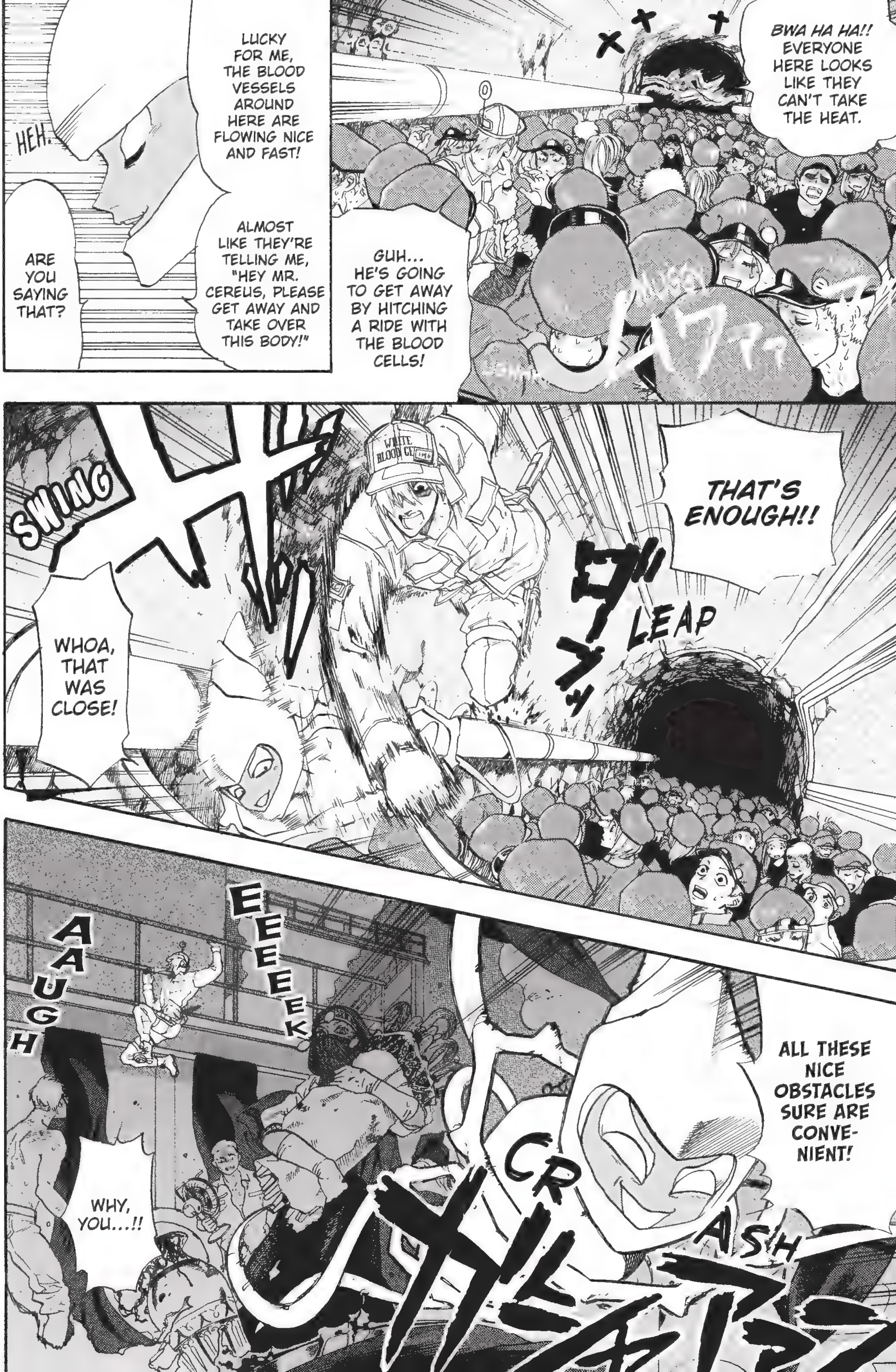

LOSING YOUR HEADS OVER A LITTLE HEAT...
WEAK... SO TRULY WEAK...
YOU DON'T DESERVE THIS BODY.
I, *BACILLUS CEREUS*, WILL TAKE IT FROM YOU!

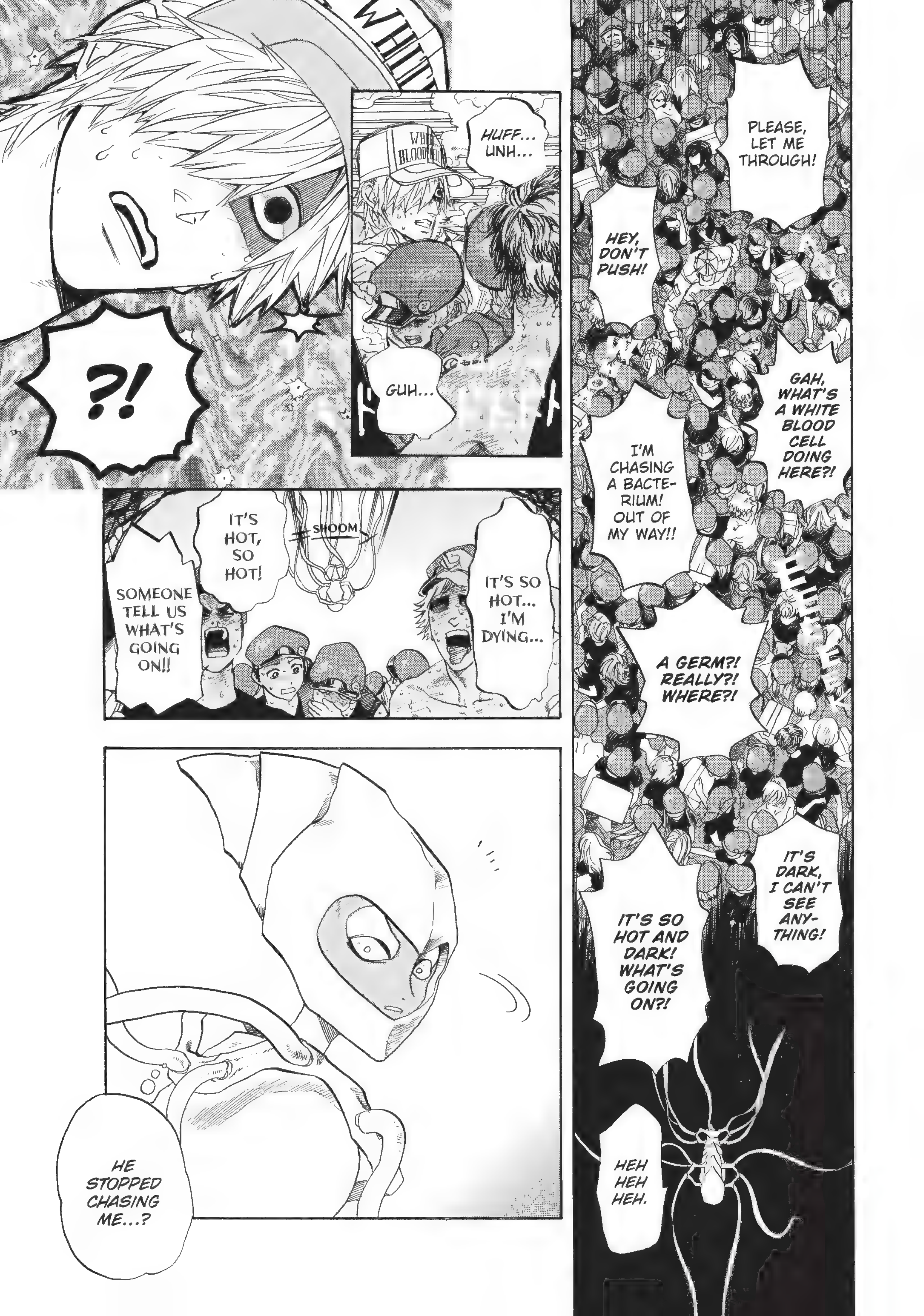
Bacillus cerus
A bacterium commonly found in soil, water, and other parts of the natural environment. It can form heat-resistant spores that can survive thirty minutes at temperatures of 210° F. It can cause two types of food poisoning, inducing either vomiting or diarrhea.

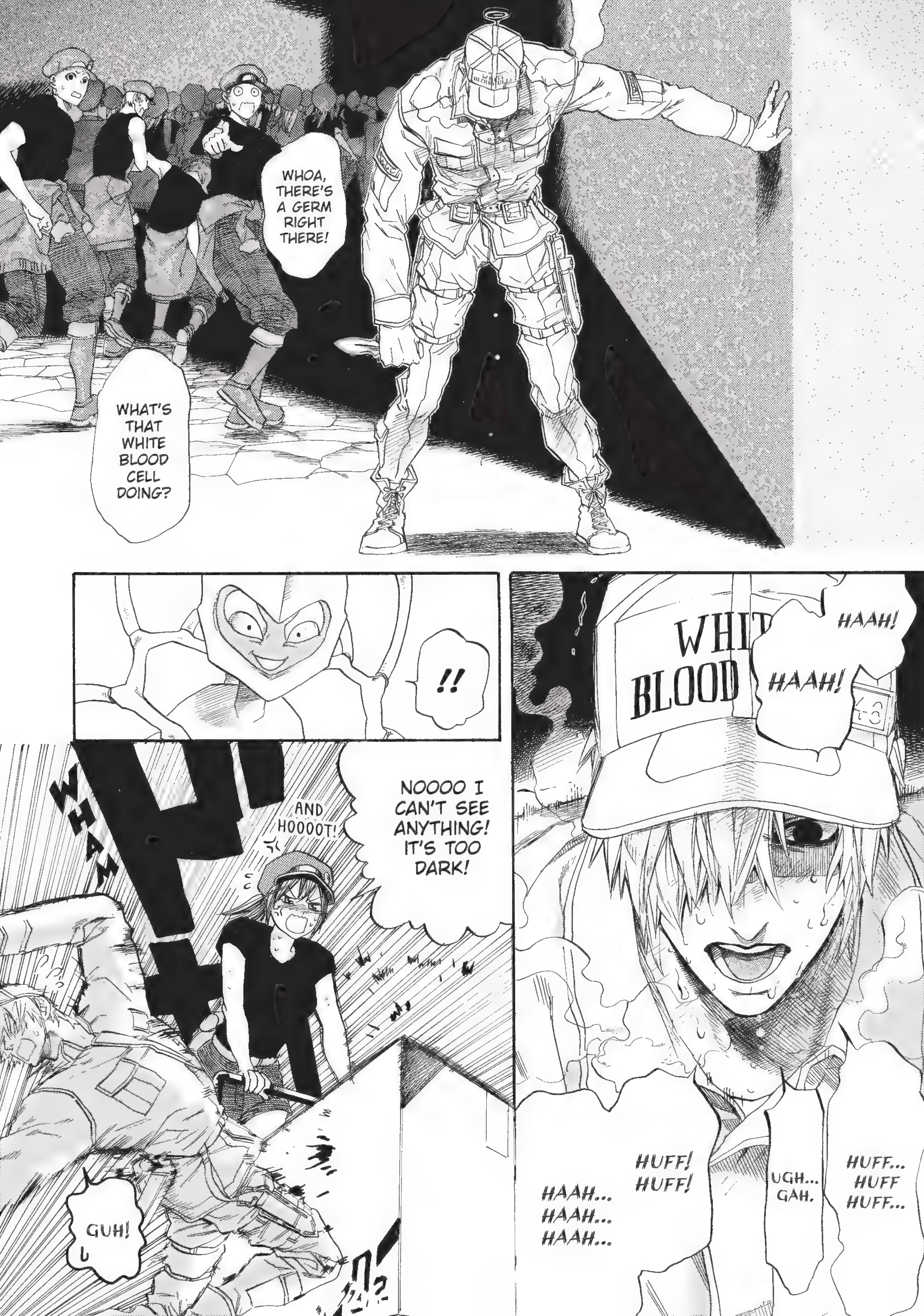
*HEAT STRESS DOES NOT INCREASE THE RISK OF INFECTION BY B. CEREUS.

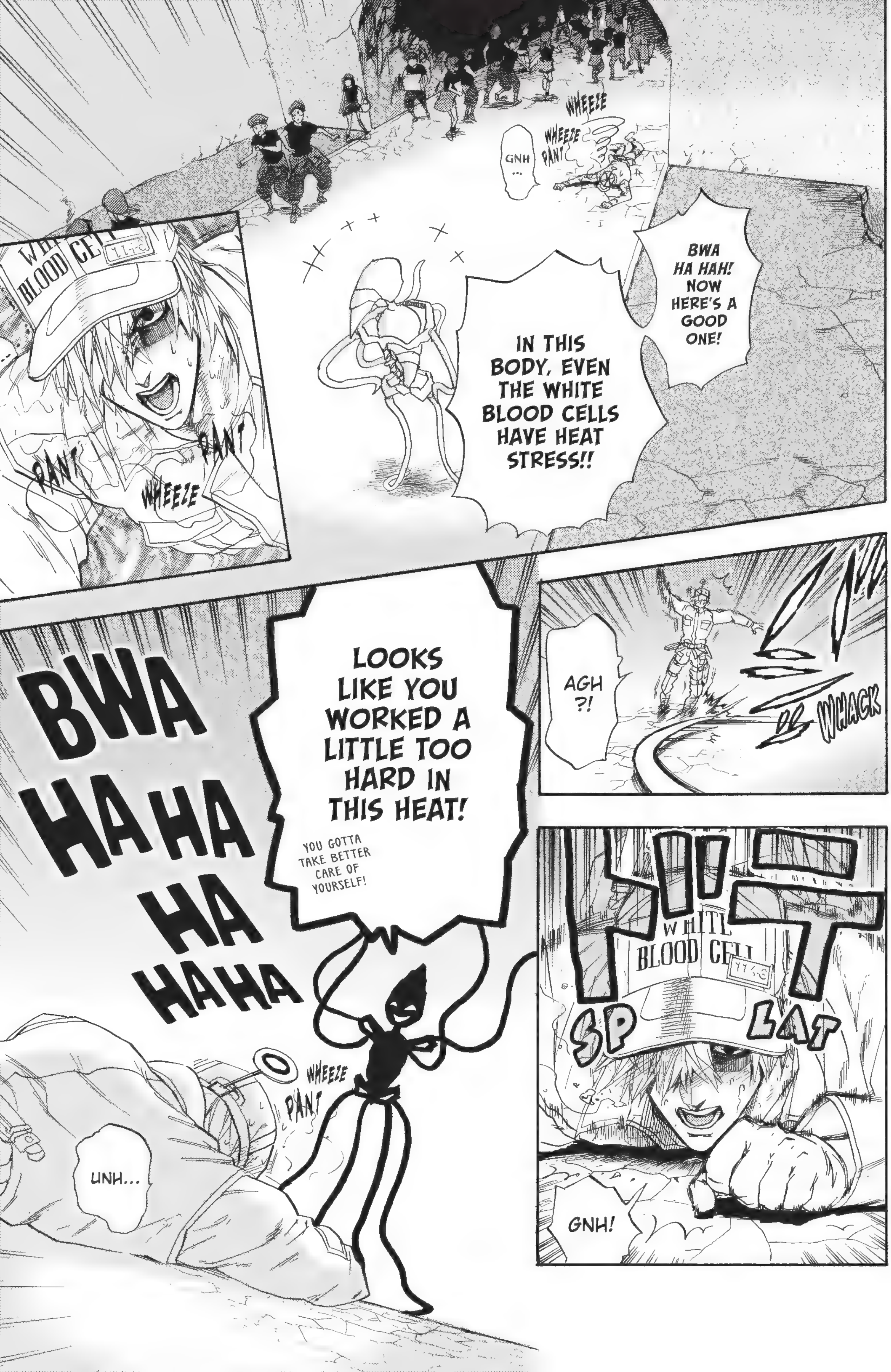

ARE YOU THE ONE THEY CALL "WHITE BLOOD CELL"?
EEEEEEK
A GERM!!
THAT'S ME.
SO, YOU'RE HERE TO KICK US WHEN WE'RE DOWN...
AAUGH
POSE
ON THE HONOR OF THE B. CEREUS SPECIES, THIS BODY SHALL BE MINE!
EN GARDE!
RED BLOOD CELL! LOOK AFTER THE PLATELETS!
WHITE BLOOD CELL
1146
PLATELET
WBC
STEP
OH, OKAY!

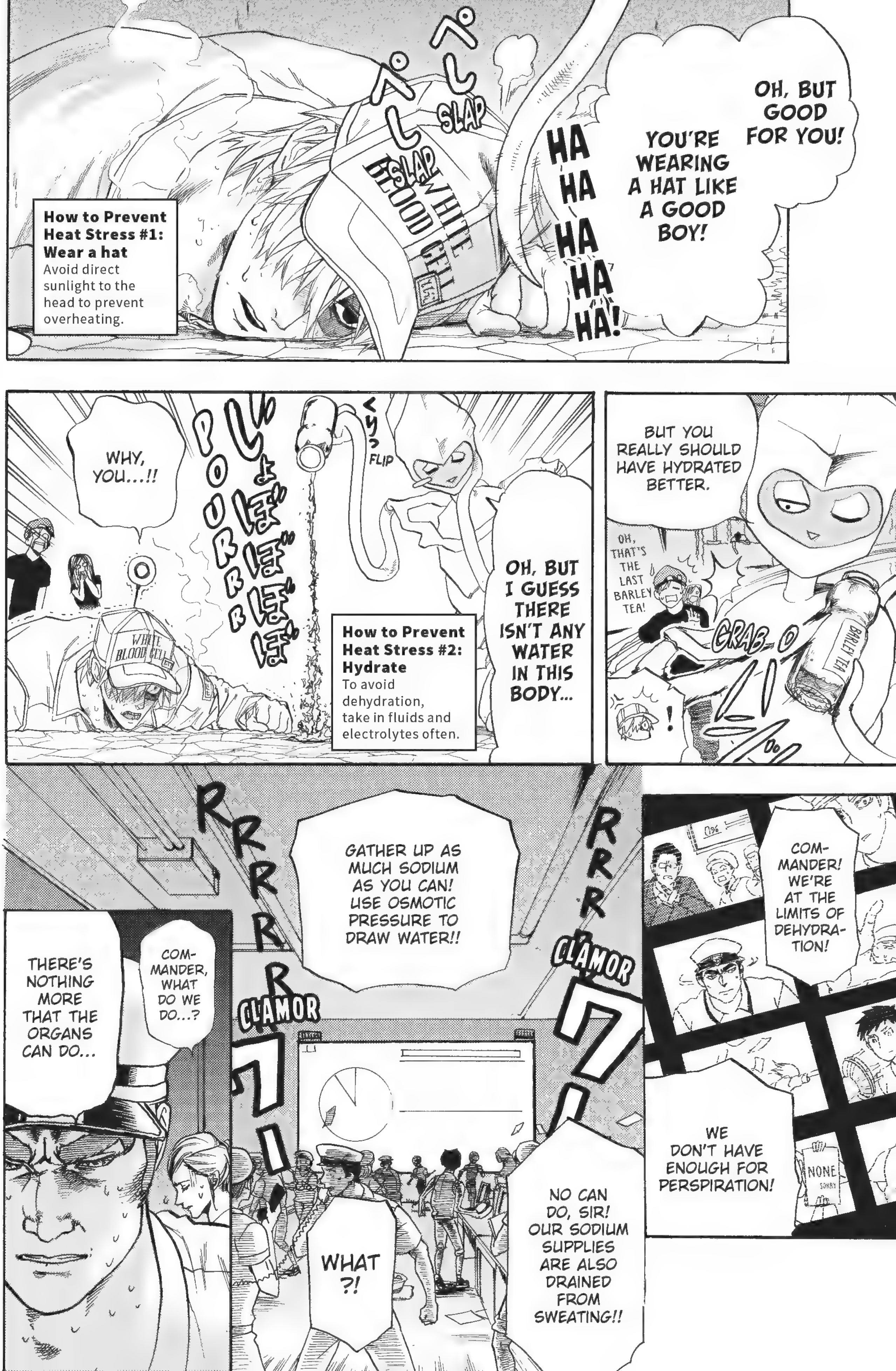

JUUUST KIDDING!
LEAP
WHAT ?!
AH HA HA HA HA HA! YOU MORON!
DID YOU REALLY THINK I'D FIGHT YOU?!
THIS WORLD'S ABOUT TO END! I'M GOING TO GO HIDE SOMEWHERE UNTIL IT DOES!!
YOU REALLY FELL FOR THAT?!
COME BACK HERE, YOU GERM BASTARD!!!
THUMP
BASTARD
BASTARD
BASTARD
BASTARD
THUMP THUMP
THUMP THUMP THUMP
AH HA HA HA!
...GO GET HIM, WHITE BLOOD CELL...


BWA HA HA!! EVERYONE HERE LOOKS LIKE THEY CAN'T TAKE THE HEAT.
GUH... HE'S GOING TO GET AWAY BY HITCHING A RIDE WITH THE BLOOD CELLS!
LUCKY FOR ME, THE BLOOD VESSELS AROUND HERE ARE FLOWING NICE AND FAST!
ALMOST LIKE THEY'RE TELLING ME, "HEY MR. CEREUS, PLEASE GET AWAY AND TAKE OVER THIS BODY!"
HEH.
ARE YOU SAYING THAT?
THAT'S ENOUGH!!
LEAP
WHITE BLOOD CELL 1146
SWING
WHOA, THAT WAS CLOSE!
ALL THESE NICE OBSTACLES SURE ARE CONVENIENT!
CRASH
EEEEEK
AAAUGH
WHY, YOU...!!


PLEASE, LET ME THROUGH!
HEY, DON'T PUSH!
GAH, WHAT'S A WHITE BLOOD CELL DOING HERE?!
I'M CHASING A BACTERIUM! OUT OF MY WAY!!
A GERM?! REALLY?! WHERE?!
IT'S DARK, I CAN'T SEE ANYTHING!
IT'S SO HOT AND DARK! WHAT'S GOING ON?!
HEH HEH HEH.
HUFF... UNH...
GUH...
?!
IT'S SO HOT... I'M DYING...
SHOOM
IT'S HOT, SO HOT!
SOMEONE TELL US WHAT'S GOING ON!!
HE STOPPED CHASING ME...?


WHOA, THERE'S A GERM RIGHT THERE!
WHAT'S THAT WHITE BLOOD CELL DOING?
WHIT BLOOD
HAAH!
HAAH!
HUFF... HUFF HUFF...
UGH... GAH.
HUFF! HUFF!
HAAH... HAAH... HAAH...
!!
NOOOO I CAN'T SEE ANYTHING! IT'S TOO DARK!
AND HOOOOT!
WHAM
GUH!

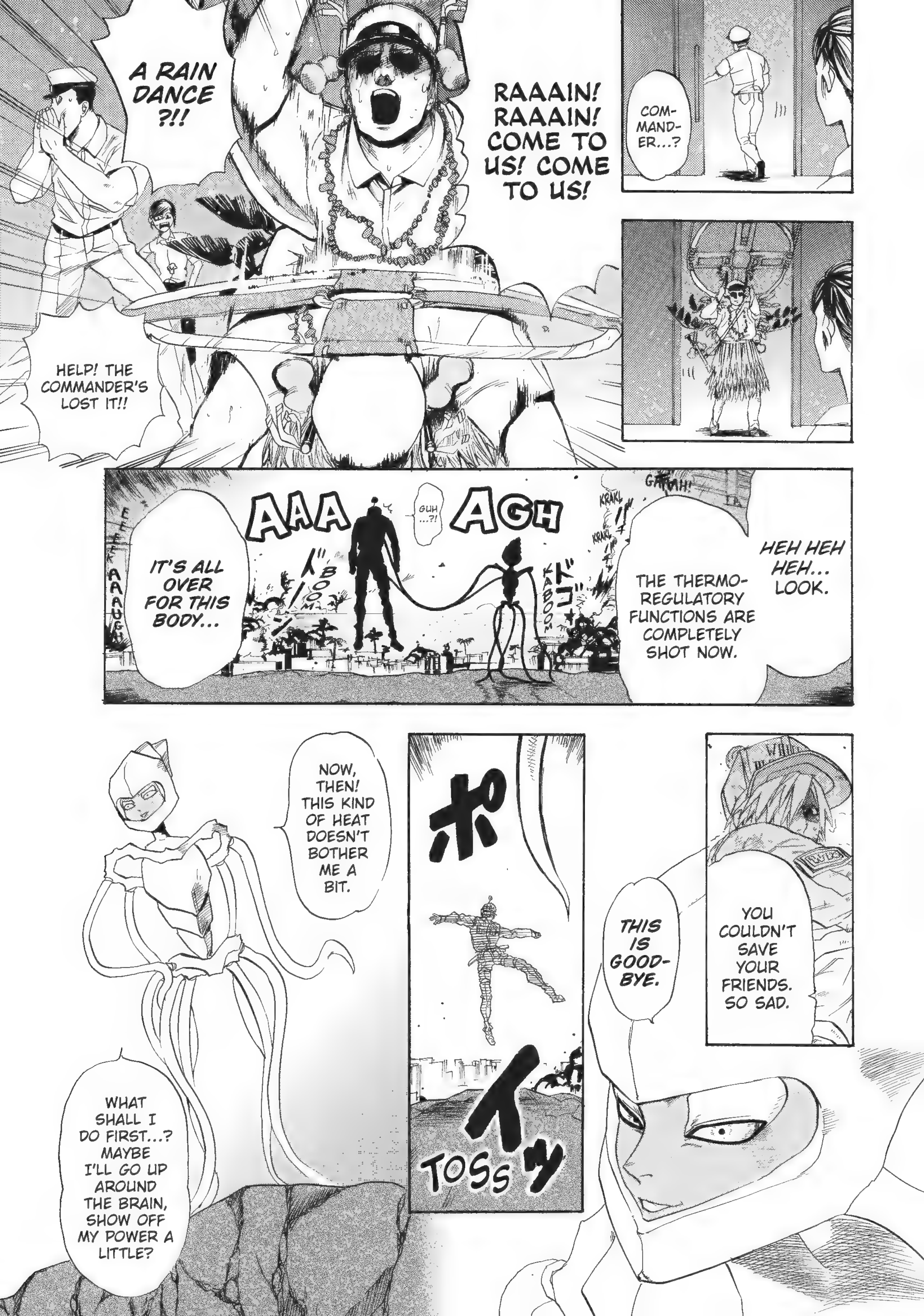

WHEEZE
WHEEZE PANT
GNH ...
BWA HA HAH! NOW HERE'S A GOOD ONE!
IN THIS BODY, EVEN THE WHITE BLOOD CELLS HAVE HEAT STRESS!!
WHITE BLOOD CELL
PANT
PANT
WHEEZE
WHACK
AGH ?!
LOOKS LIKE YOU WORKED A LITTLE TOO HARD IN THIS HEAT!
YOU GOTTA TAKE BETTER CARE OF YOURSELF!
BWA HA HA HA HA HA HA
WHITE BLOOD CELL
SPLAT
GNH!
WHEEZE
PANT
UNH...

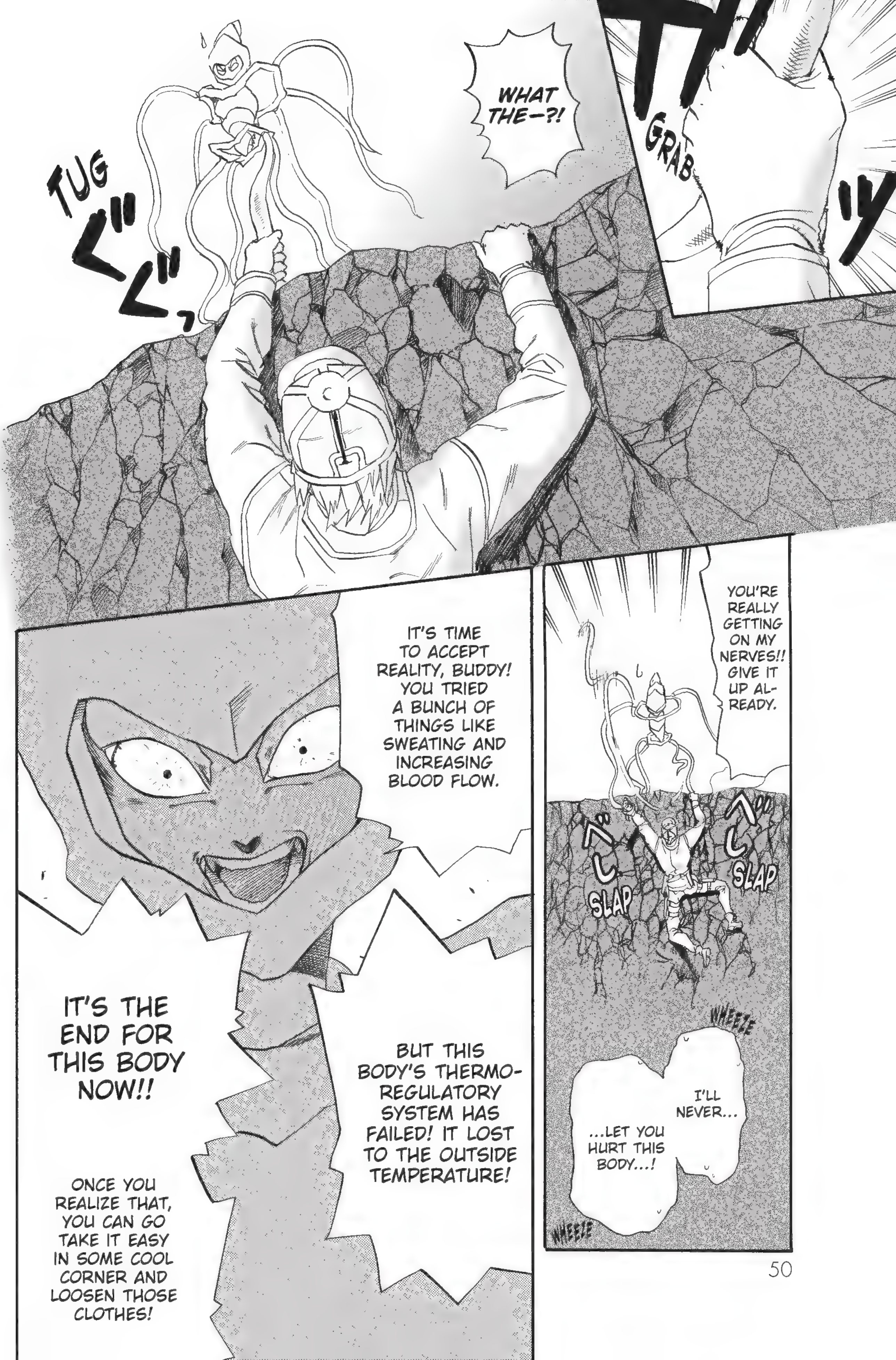


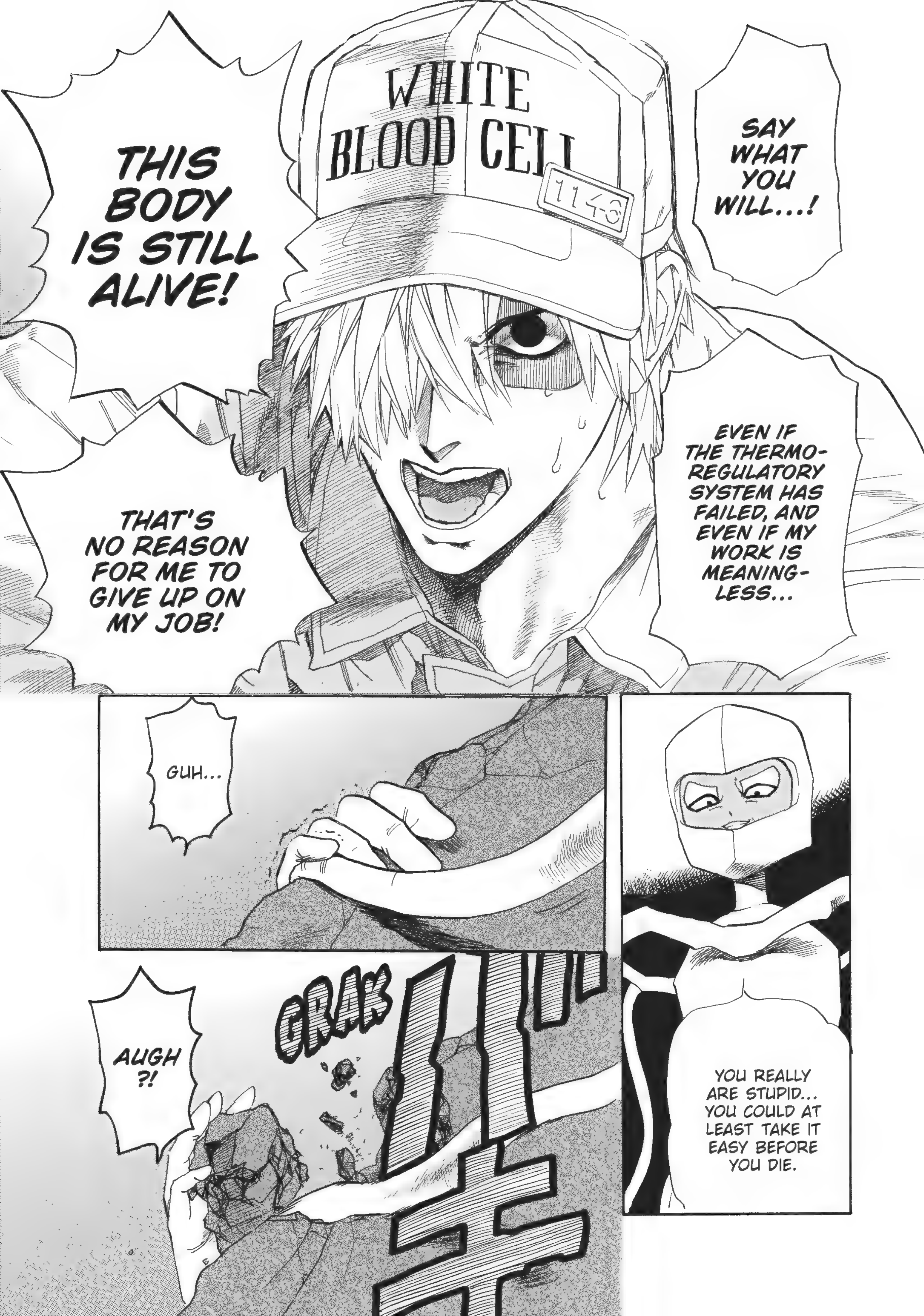
How to Prevent Heat Stress #1: Wear a hat
Avoid direct sunlight to the head to prevent overheating.

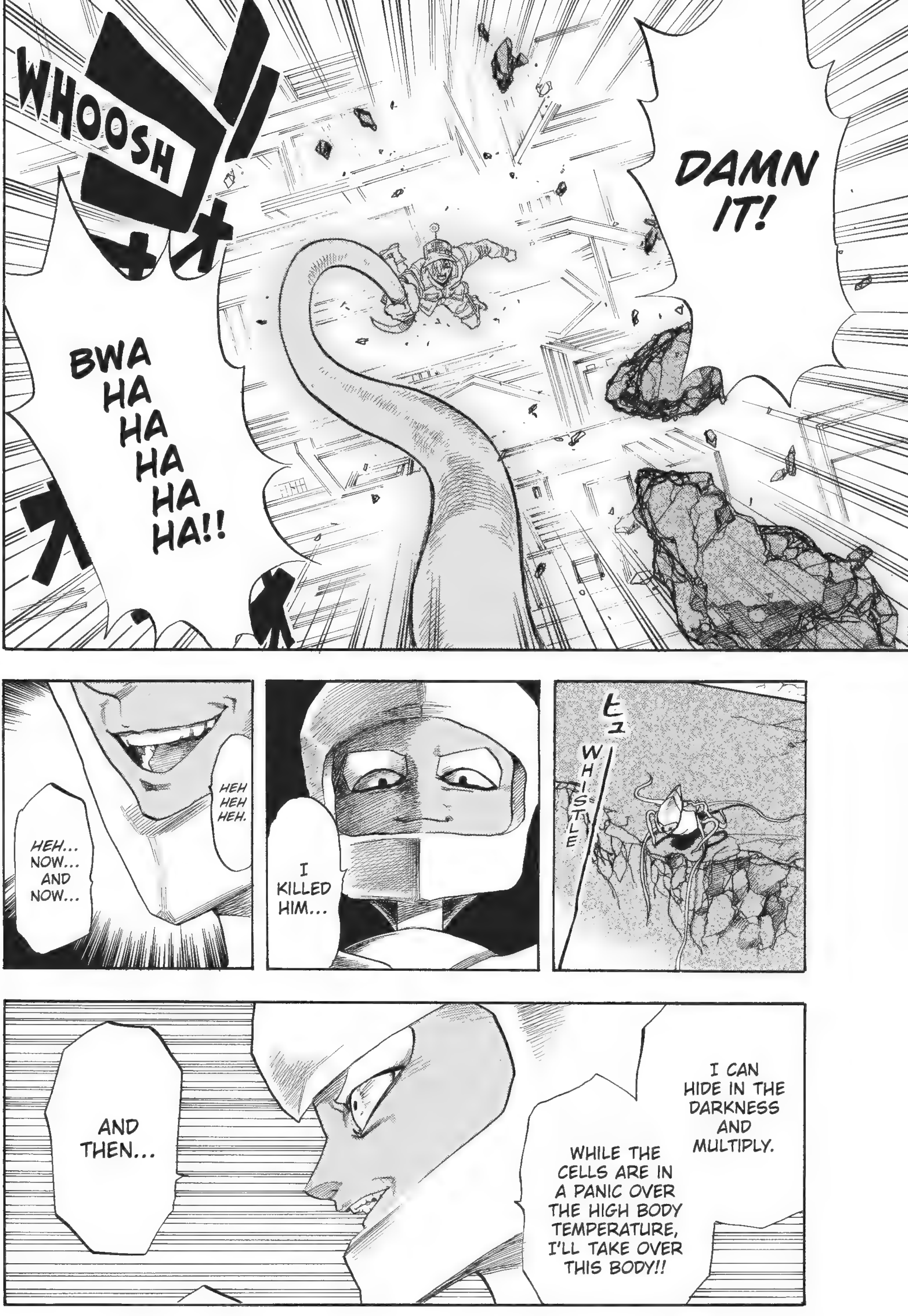
How to Prevent Heat Stress #2: Hydrate
To avoid dehydration, take in fluids and electrolytes often.

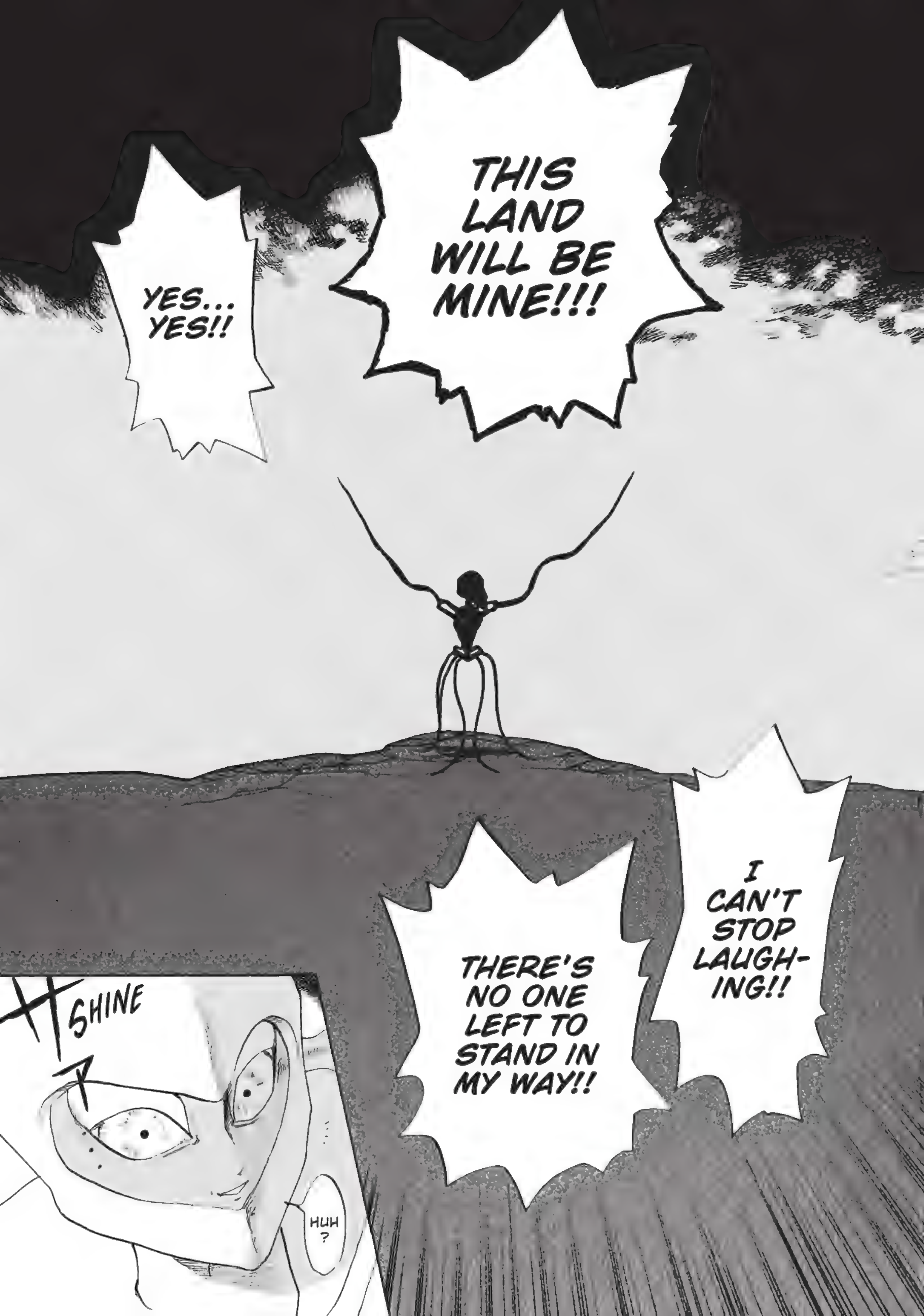
ぺしぺし
SLAP SLAP
WHITE BLOOD CELL
U-1146
OH, BUT GOOD FOR YOU!
YOU'RE WEARING A HAT LIKE A GOOD BOY!
HA HA HA HA HA!
BUT YOU REALLY SHOULD HAVE HYDRATED BETTER.
OH, THAT'S THE LAST BARLEY TEA!
GRAB
BARLEY TEA
くりっ
FLIP
OH, BUT I GUESS THERE ISN'T ANY WATER IN THIS BODY...
じょぼぼぼぼ
POURRR
WHY, YOU...!!
WHITE BLOOD CELL
0%
COMMANDER! WE'RE AT THE LIMITS OF DEHYDRATION!
WE DON'T HAVE ENOUGH FOR PERSPIRATION!
NONE
SORRY
RRRR
CLAMOR
ワー
GATHER UP AS MUCH SODIUM AS YOU CAN! USE OSMOTIC PRESSURE TO DRAW WATER!!
NO CAN DO, SIR! OUR SODIUM SUPPLIES ARE ALSO DRAINED FROM SWEATING!!
WHAT?!
COMMANDER, WHAT DO WE DO...?
THERE'S NOTHING MORE THAT THE ORGANS CAN DO...

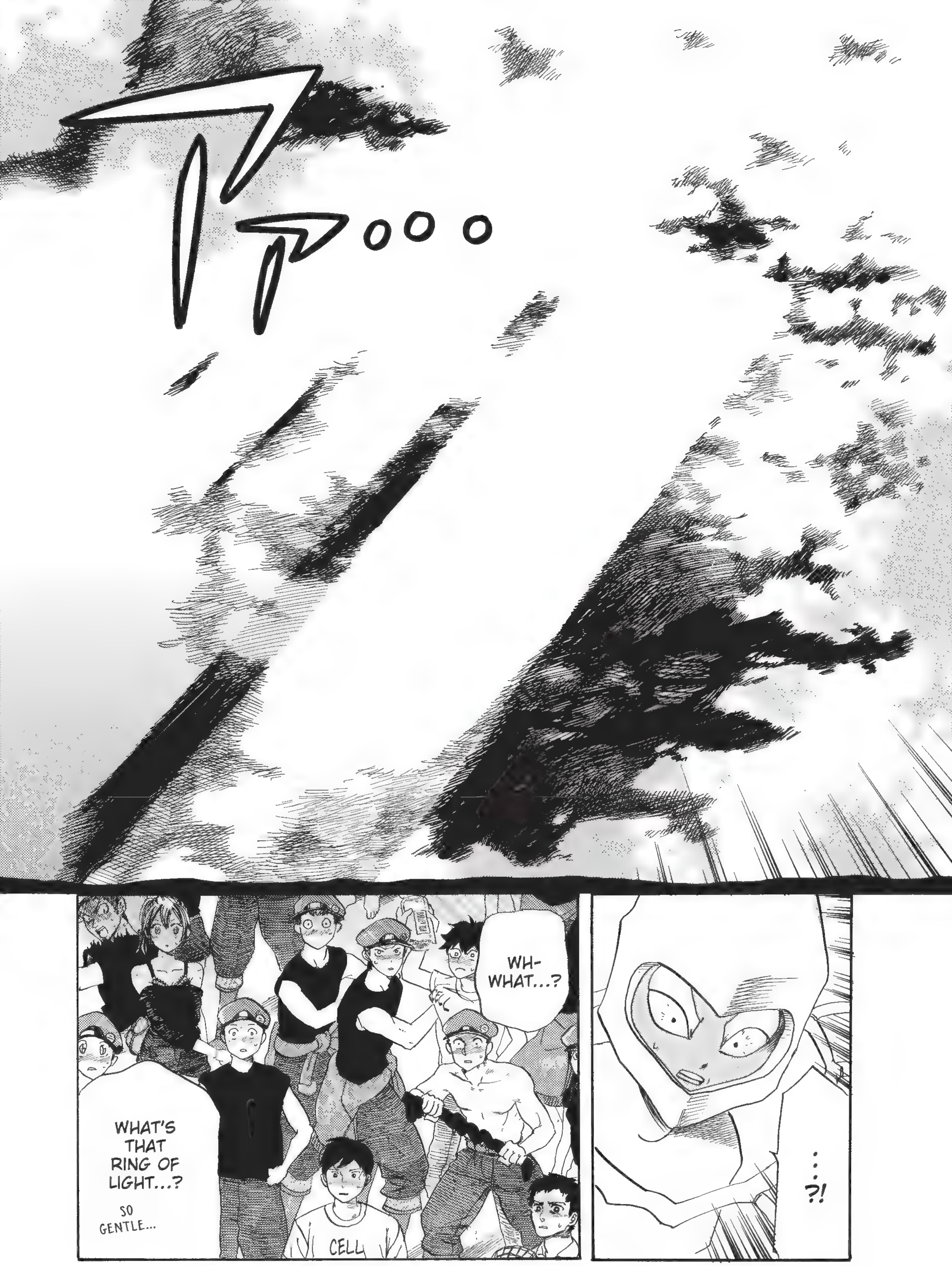

COM-MANDER...?
RAAAIN! RAAAIN! COME TO US! COME TO US!
A RAIN DANCE?!!
HELP! THE COMMANDER'S LOST IT!!
HEH HEH HEH... LOOK.
THE THERMO-REGULATORY FUNCTIONS ARE COMPLETELY SHOT NOW.
KRAKL
KRAKL
KABOOM
AAAAGH
GUH...?!
BOOM
IT'S ALL OVER FOR THIS BODY...
EEEEK
AAAAUGH
YOU COULDN'T SAVE YOUR FRIENDS. SO SAD.
THIS IS GOOD-BYE.
ポイッ
TOSS
NOW, THEN! THIS KIND OF HEAT DOESN'T BOTHER ME A BIT.
WHAT SHALL I DO FIRST...? MAYBE I'LL GO UP AROUND THE BRAIN, SHOW OFF MY POWER A LITTLE?

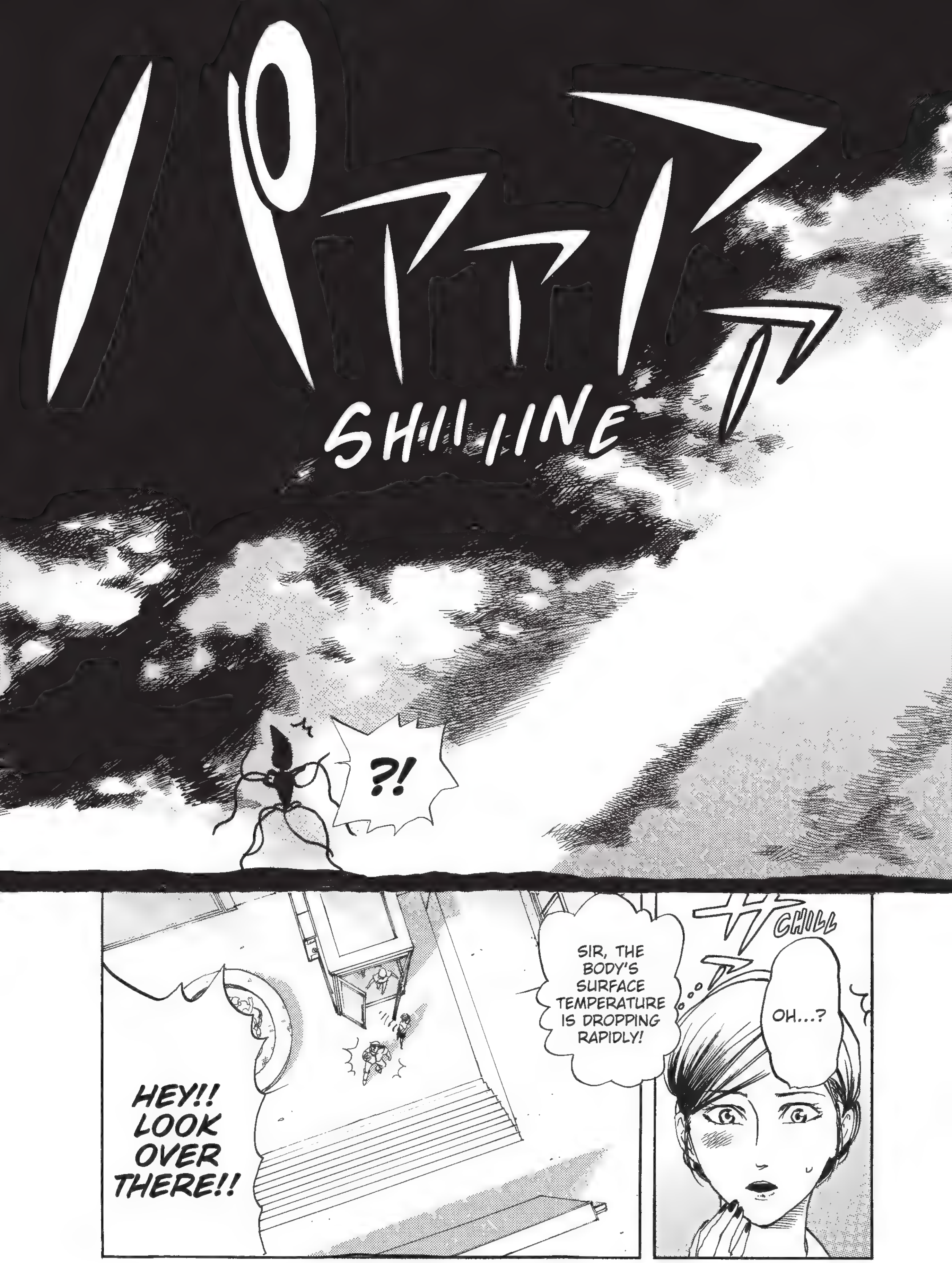

GRAB
WHAT THE—?!
TUG ぐいぐい
YOU'RE REALLY GETTING ON MY NERVES!! GIVE IT UP ALREADY.
SLAP べし
SLAP べし
WHEEZE
I'LL NEVER...
...LET YOU HURT THIS BODY...!
WHEEZE
IT'S TIME TO ACCEPT REALITY, BUDDY! YOU TRIED A BUNCH OF THINGS LIKE SWEATING AND INCREASING BLOOD FLOW.
BUT THIS BODY'S THERMOREGULATORY SYSTEM HAS FAILED! IT LOST TO THE OUTSIDE TEMPERATURE!
IT'S THE END FOR THIS BODY NOW!!
ONCE YOU REALIZE THAT, YOU CAN GO TAKE IT EASY IN SOME COOL CORNER AND LOOSEN THOSE CLOTHES!

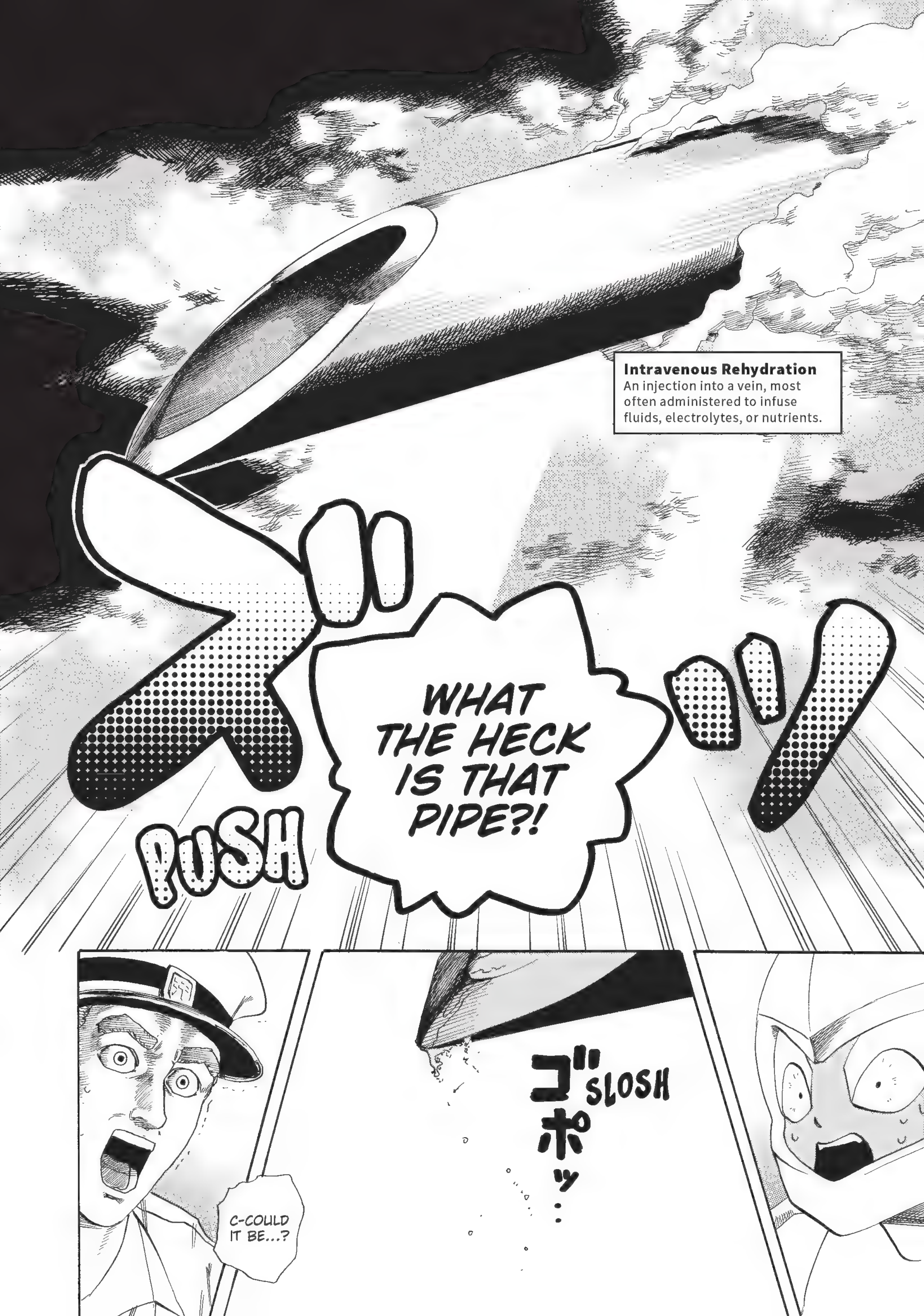

WHITE BLOOD CELL
1146
SAY WHAT YOU WILL...!
THIS BODY IS STILL ALIVE!
EVEN IF THE THERMOREGULATORY SYSTEM HAS FAILED, AND EVEN IF MY WORK IS MEANINGLESS...
THAT'S NO REASON FOR ME TO GIVE UP ON MY JOB!
YOU REALLY ARE STUPID... YOU COULD AT LEAST TAKE IT EASY BEFORE YOU DIE.
GUH...
GRAK
AUGH ?!


DAMN IT!
WHOOSH
BWA HA HA HA HA HA HA!!
ヒュ
WHISTLE
I KILLED HIM...
HEH HEH HEH.
HEH... NOW... AND NOW...
I CAN HIDE IN THE DARKNESS AND MULTIPLY.
WHILE THE CELLS ARE IN A PANIC OVER THE HIGH BODY TEMPERATURE, I'LL TAKE OVER THIS BODY!!
AND THEN...


THIS LAND WILL BE MINE!!!
YES... YES!!
I CAN'T STOP LAUGHING!!
THERE'S NO ONE LEFT TO STAND IN MY WAY!!
SHINE
HUH?

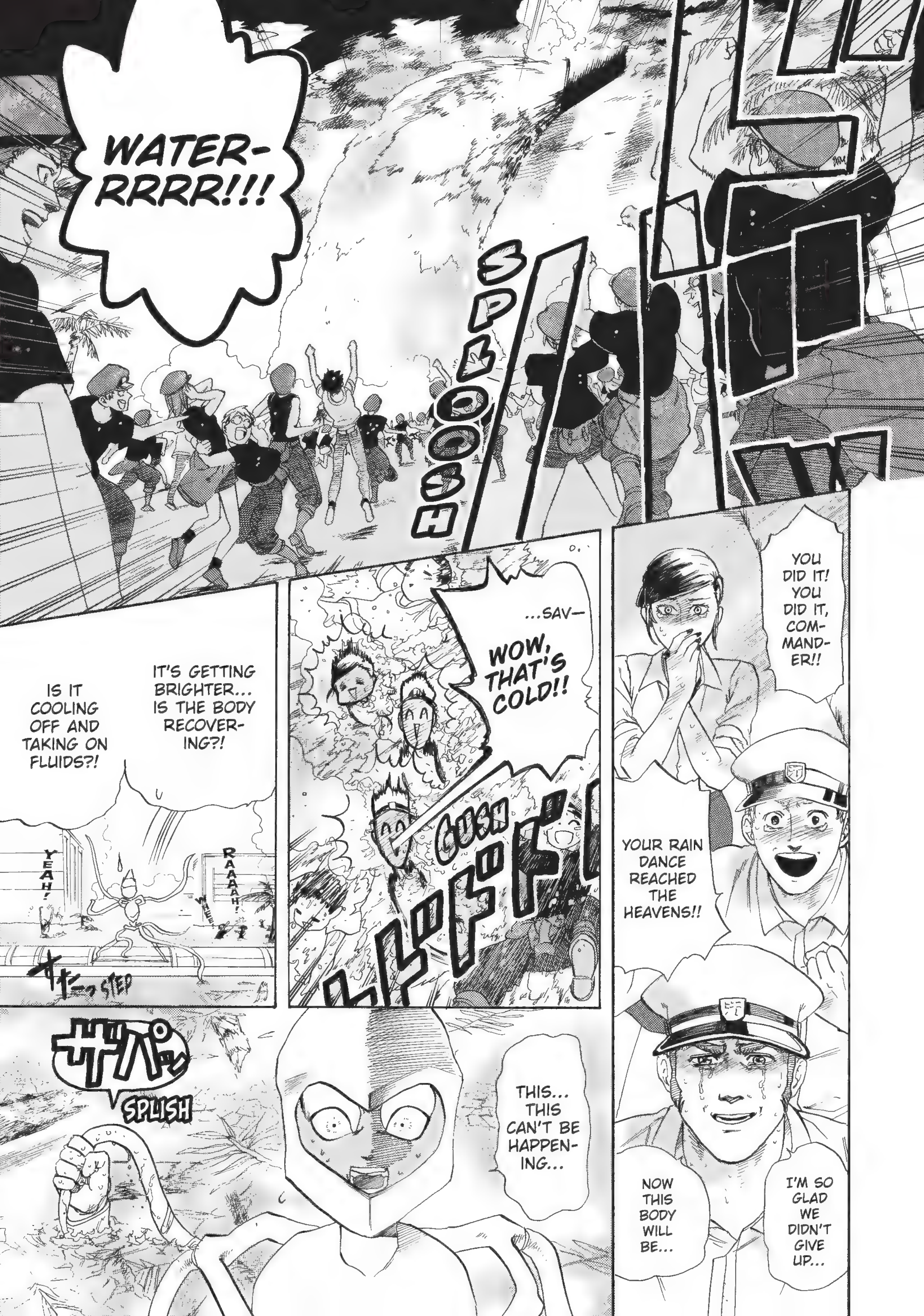

アァooo
...?!
WH-WHAT...?
WHAT'S THAT RING OF LIGHT...?
SO GENTLE...
CELL

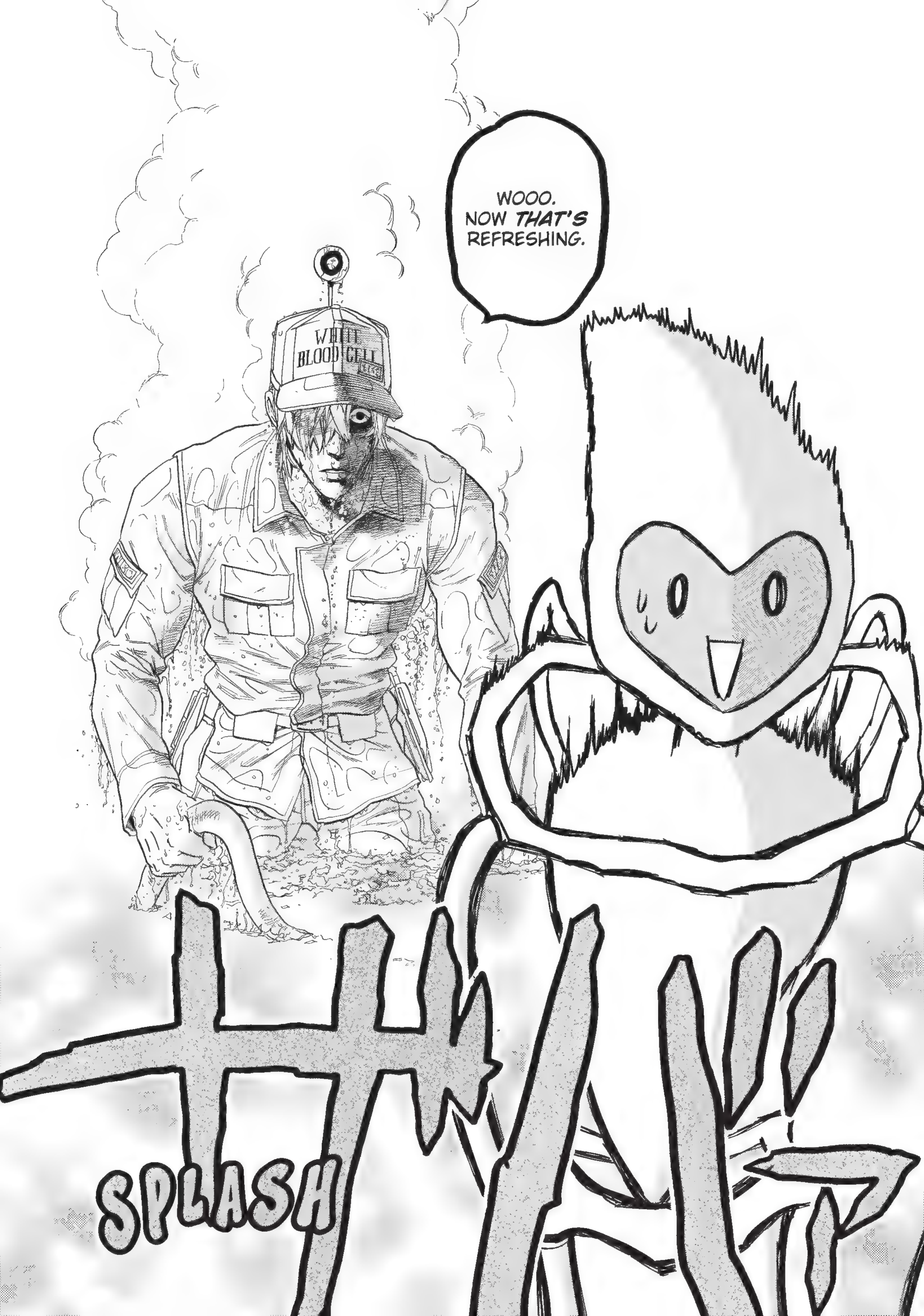

パァァァアァ
SHIIIINE
?!
サ
CHILL
OH...?
SIR, THE BODY'S SURFACE TEMPERATURE IS DROPPING RAPIDLY!
HEY!! LOOK OVER THERE!!

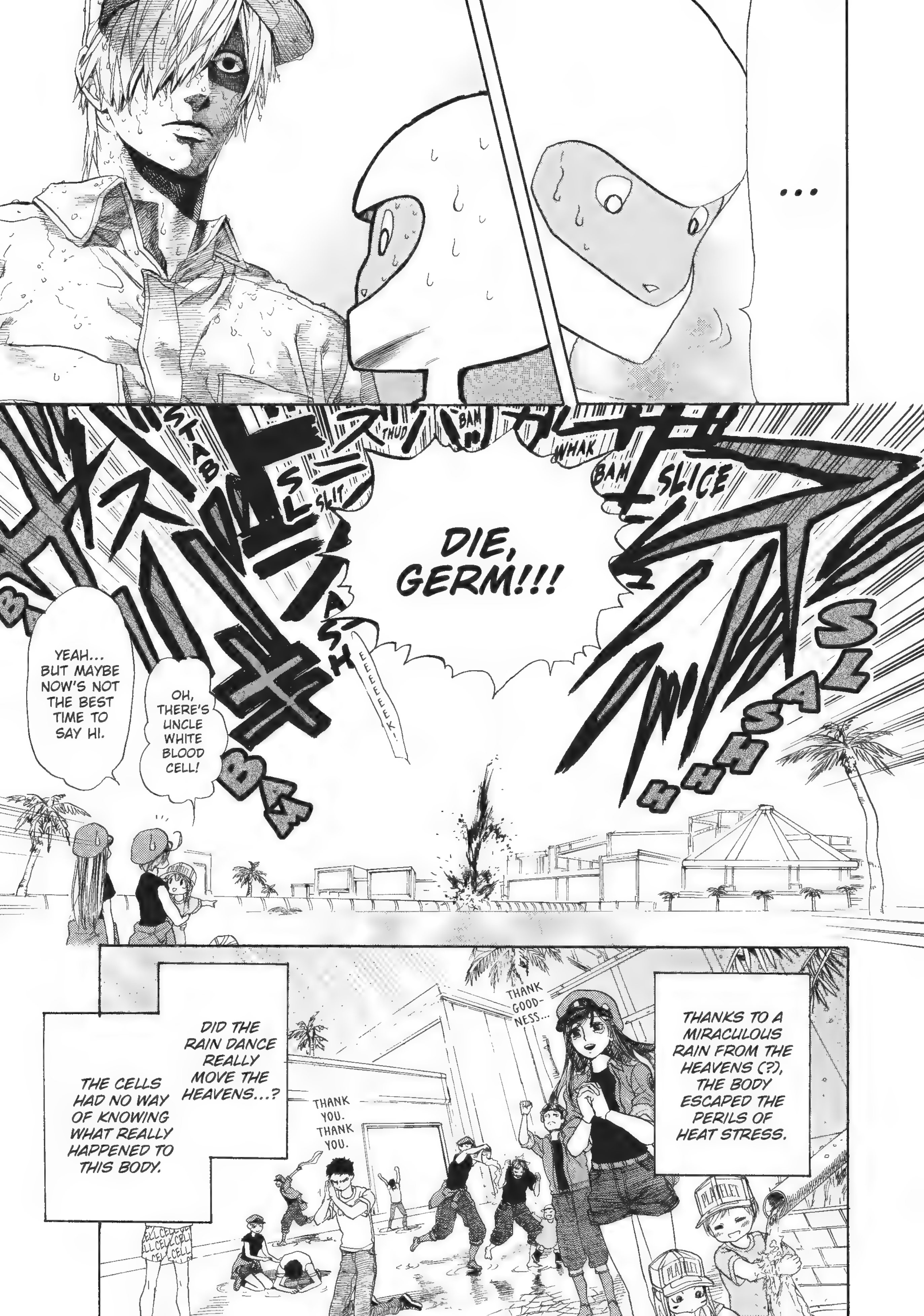


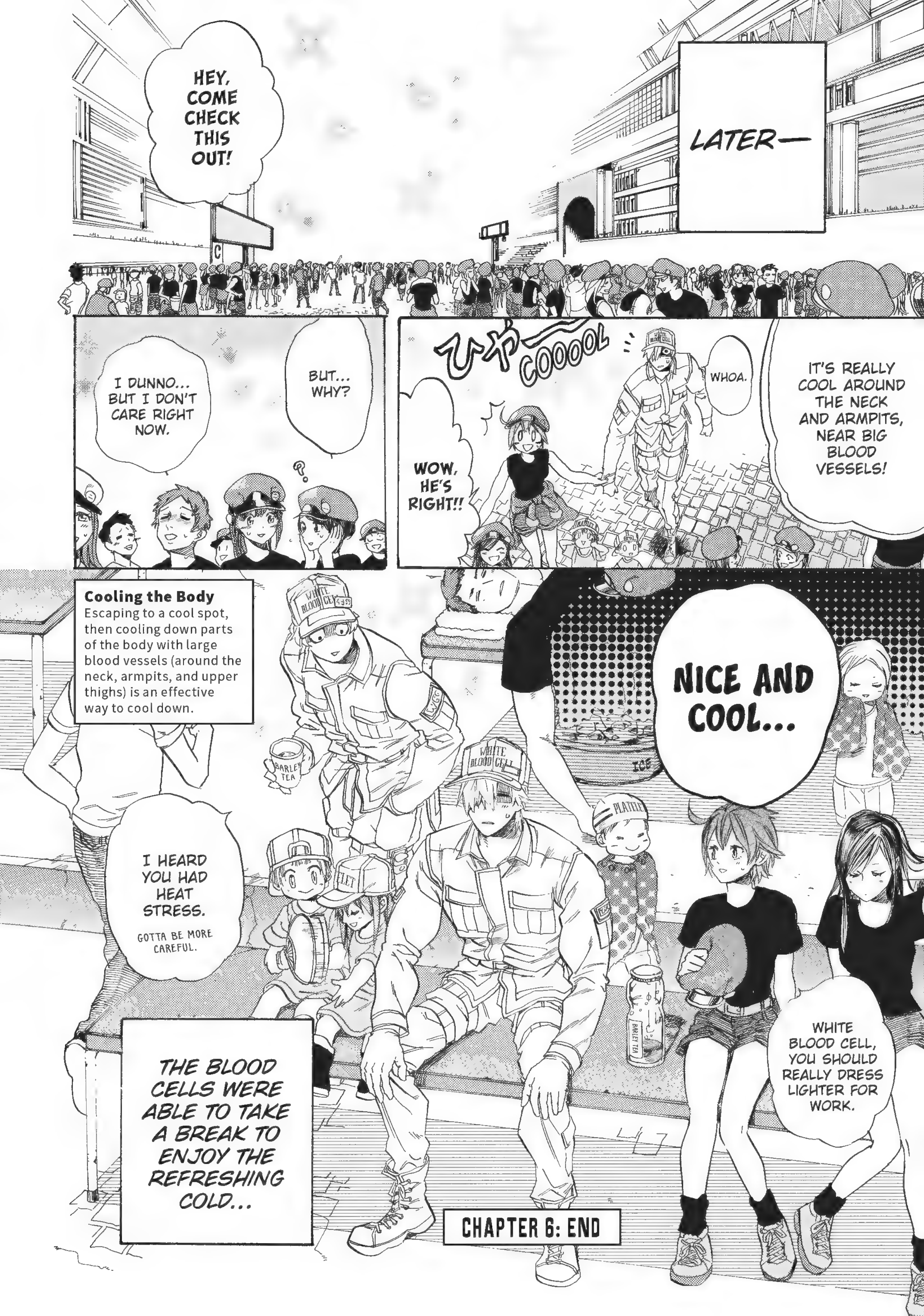
Intravenous Rehydration
An injection into a vein, most often administered to infuse fluids, electrolytes, or nutrients.

ズッ
PUSH
WHAT THE HECK IS THAT PIPE?!
ゴポッ..
SLOSH
C-COULD IT BE...?


WATER-RRRR!!!
SPLOOOSH
YOU DID IT! YOU DID IT, COMMANDER!!
YOUR RAIN DANCE REACHED THE HEAVENS!!
...SAV—
WOW, THAT'S COLD!!
GUSH
IT'S GETTING BRIGHTER... IS THE BODY RECOVERING?!
IS IT COOLING OFF AND TAKING ON FLUIDS?!
RAAAAH!
WHEE
YEAH!
STEP
I'M SO GLAD WE DIDN'T GIVE UP...
NOW THIS BODY WILL BE...
THIS... THIS CAN'T BE HAPPENING...
ザパッ
SPLISH

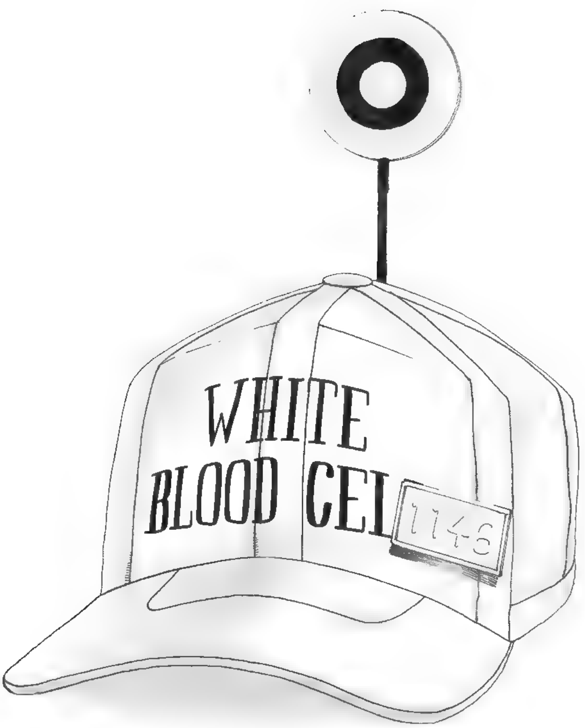

WOOO. NOW *THAT'S* REFRESHING.
WHITE BLOOD CELL
1146
SPLASH


...
STAB
THUD
BAM
WHAK
BAM
SLICE
SLIT
SLASH
DIE, GERM!!!
SLASHHHH
EEEEEEEK!
OH, THERE'S UNCLE WHITE BLOOD CELL!
YEAH... BUT MAYBE NOW'S NOT THE BEST TIME TO SAY HI.
BAM
THANKS TO A MIRACULOUS RAIN FROM THE HEAVENS (?), THE BODY ESCAPED THE PERILS OF HEAT STRESS.
THANK GOODNESS...
THANK YOU. THANK YOU.
DID THE RAIN DANCE REALLY MOVE THE HEAVENS...?
THE CELLS HAD NO WAY OF KNOWING WHAT REALLY HAPPENED TO THIS BODY.
PLATELET
PLATELET
CELL CELL CELL

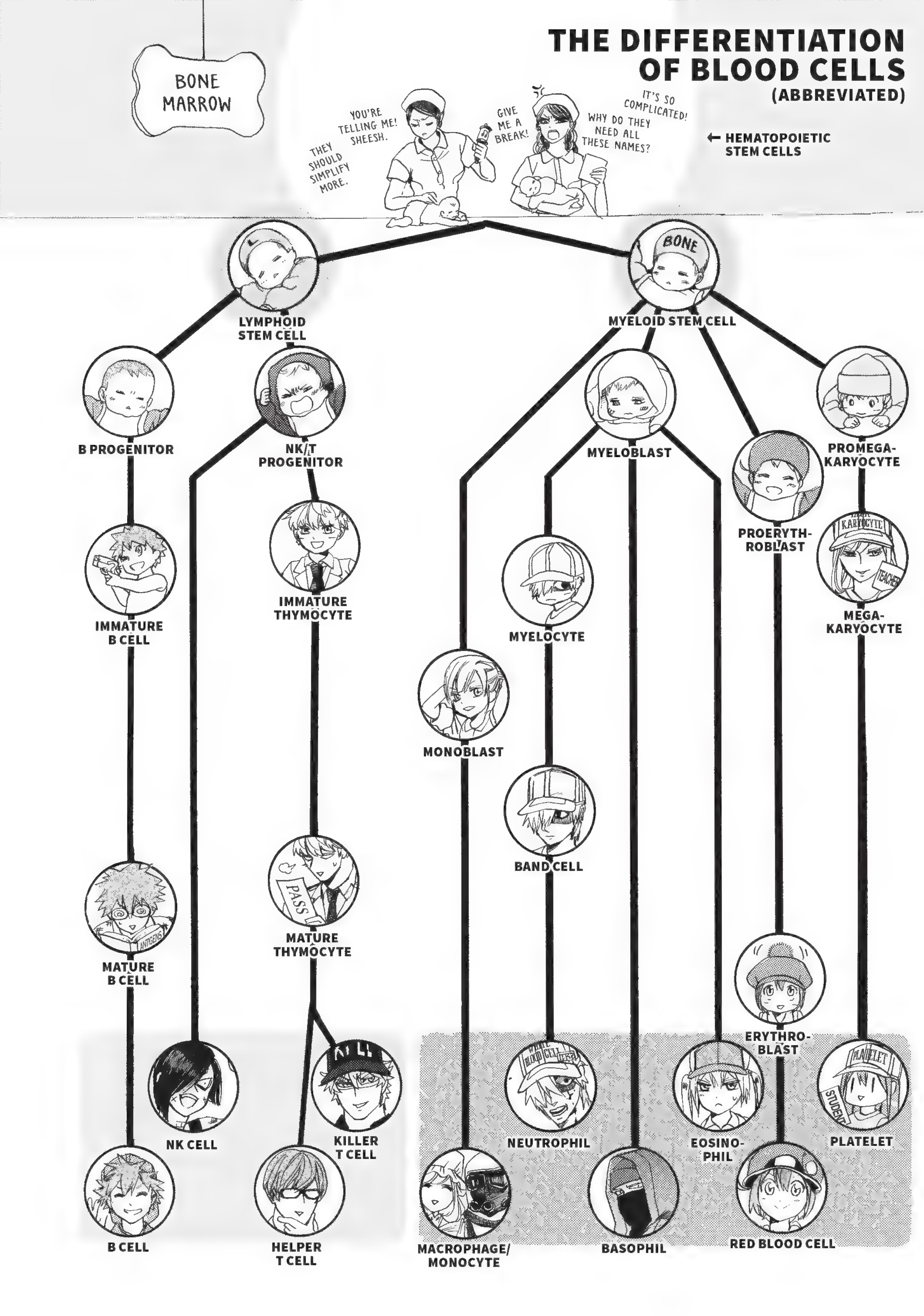

LATER—
HEY, COME CHECK THIS OUT!
C
IT'S REALLY COOL AROUND THE NECK AND ARMPITS, NEAR BIG BLOOD VESSELS!
WHOA.
WHITE BLOOD CELL
ひや—COOOOL
WOW, HE'S RIGHT!!
PLATELET
BUT... WHY?
I DUNNO... BUT I DON'T CARE RIGHT NOW.
?
NICE AND COOL...
ICE
WHITE BLOOD CELL
BARLEY TEA
PLATELET
I HEARD YOU HAD HEAT STRESS.
GOTTA BE MORE CAREFUL.
WHITE BLOOD CELL, YOU SHOULD REALLY DRESS LIGHTER FOR WORK.
BARLEY TEA
THE BLOOD CELLS WERE ABLE TO TAKE A BREAK TO ENJOY THE REFRESHING COLD...

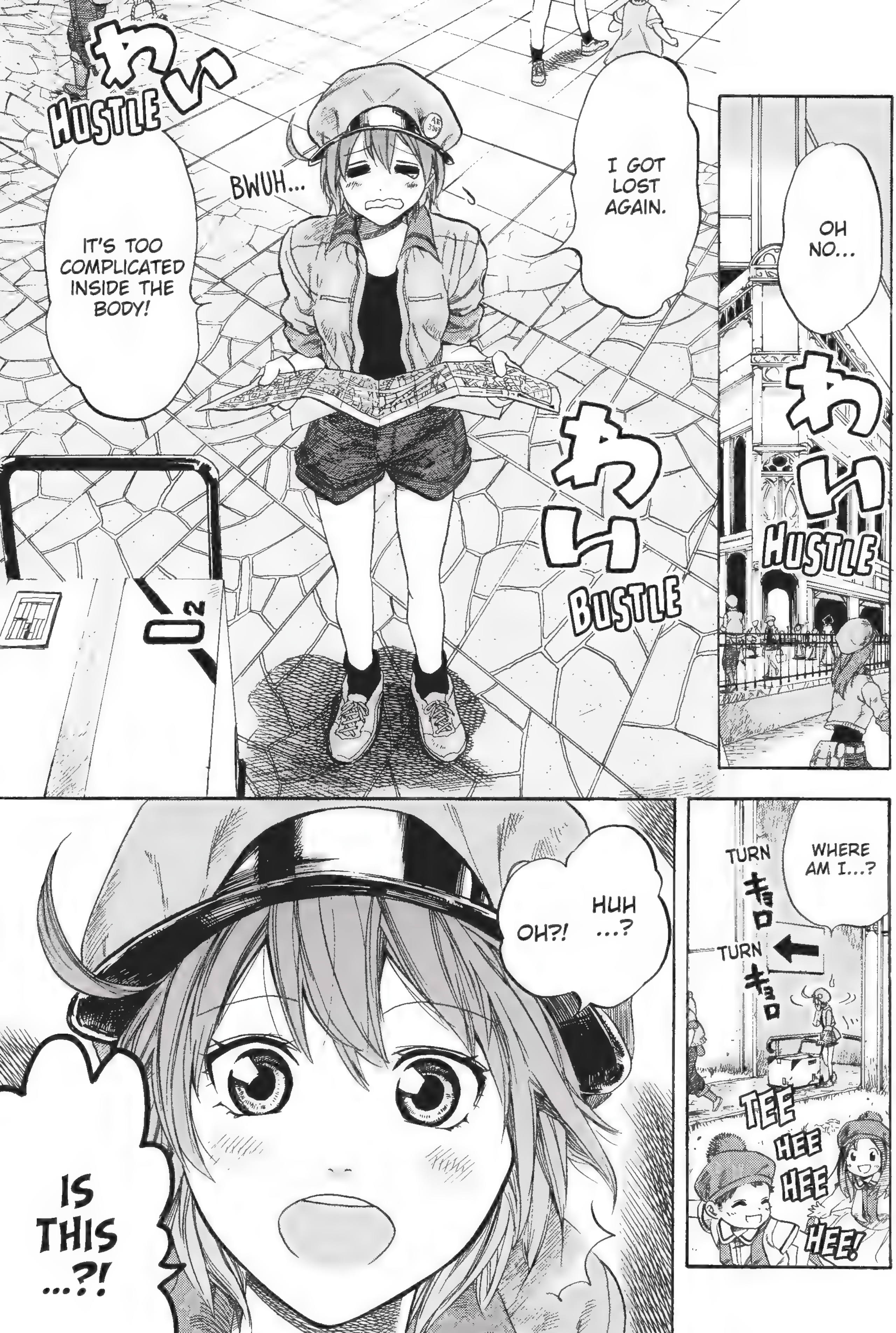
Cooling the Body
Escaping to a cool spot, then cooling down parts of the body with large blood vessels (around the neck, armpits, and upper thighs) is an effective way to cool down.

CHAPTER 6: END


WHITE
BLOOD CEL
1146

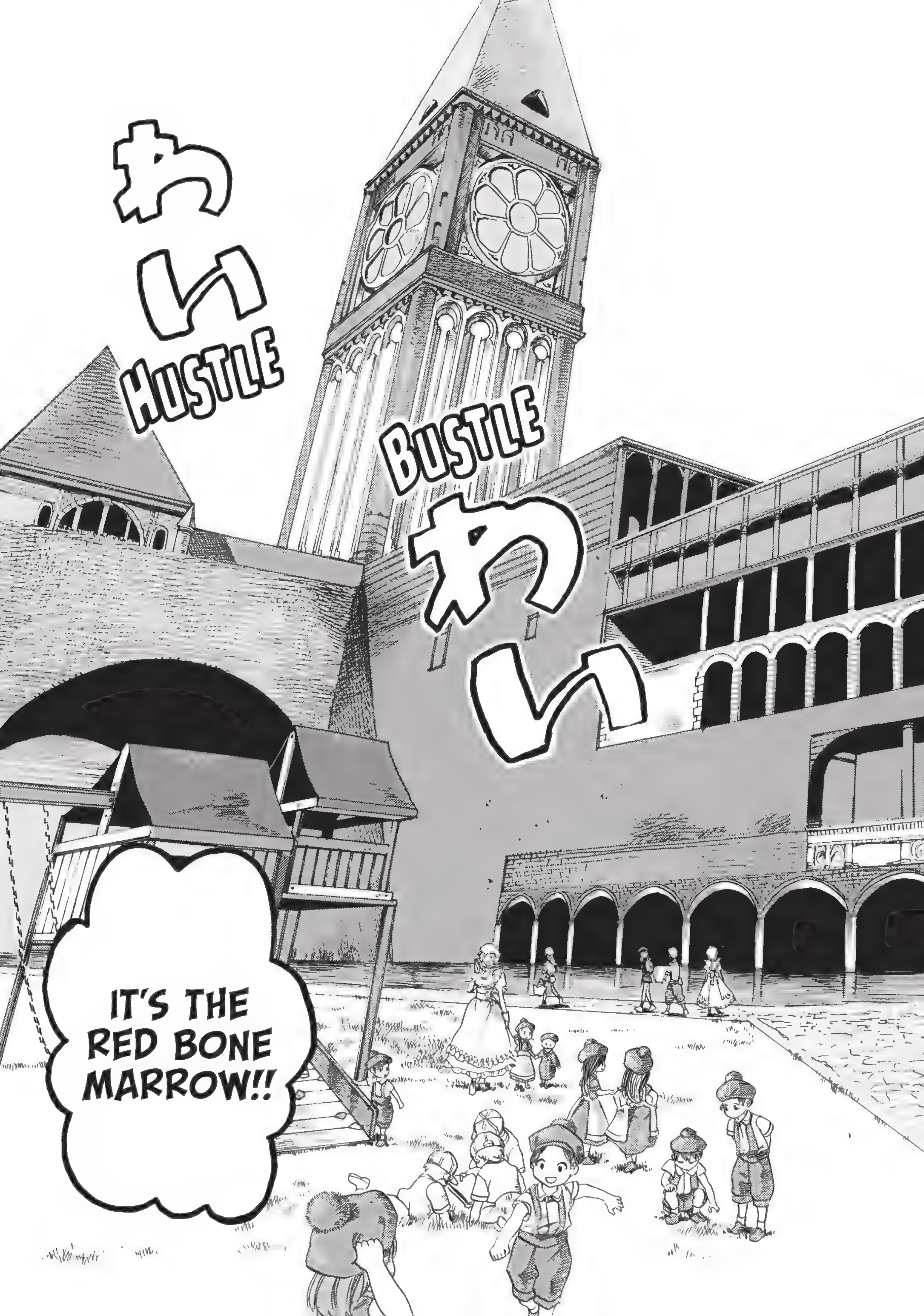
THE DIFFERENTIATION OF BLOOD CELLS
(ABBREVIATED)

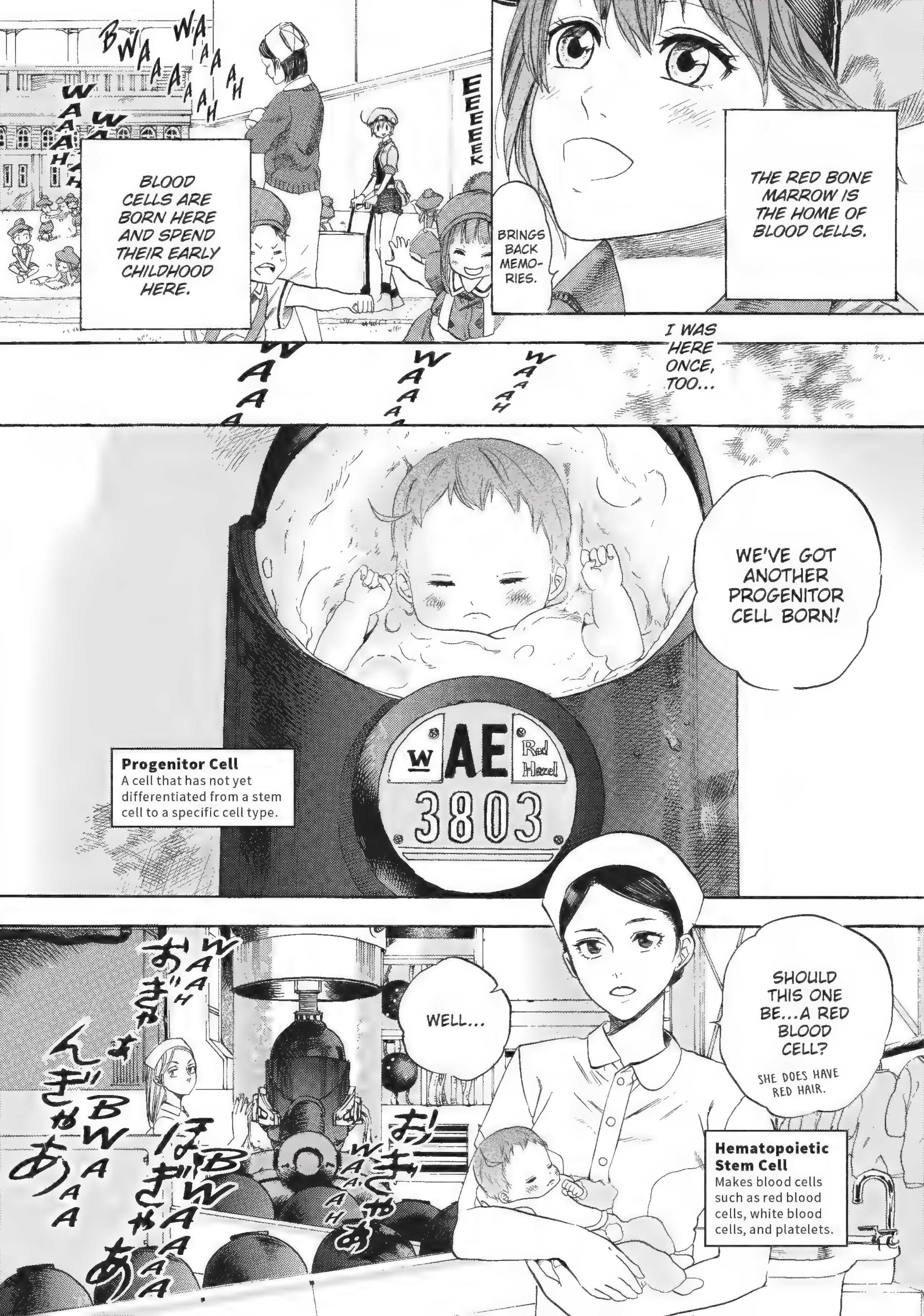

BONE MARROW
THEY SHOULD SIMPLIFY MORE.
YOU'RE TELLING ME! SHEESH.
GIVE ME A BREAK!
WHY DO THEY NEED ALL THESE NAMES?
IT'S SO COMPLICATED!
← HEMATOPOIETIC STEM CELLS
BONE
LYMPHOID STEM CELL
MYELOID STEM CELL
B PROGENITOR
NK/T PROGENITOR
MYELOBLAST
PROERYTHROBLAST
PROMEGAKARYOCYTE
IMMATURE B CELL
IMMATURE THYMOCYTE
MYELOCYTE
KARYOCYTE
TEACHER
MEGAKARYOCYTE
MONOBLAST
BAND CELL
MATURE B CELL
ANTIGENS
PASS
MATURE THYMOCYTE
ERYTHROBLAST
NK CELL
KILLER T CELL
WHITE BLOOD CELL
NEUTROPHIL
EOSINOPHIL
PLATELET
STUDENT
PLATELET
B CELL
HELPER T CELL
MACROPHAGE/MONOCYTE
BASOPHIL
RED BLOOD CELL


OH NO...
わい
HUSTLE
I GOT LOST AGAIN.
BWUH...
IT'S TOO COMPLICATED INSIDE THE BODY!
わい
HUSTLE
わい
BUSTLE
AE 3803
O2
WHERE AM I...?
TURN
キョロ
TURN
キョロ
TEE HEE HEE HEE!
HUH ...?
OH?!
IS THIS ...?!

CHAPTER 7:
ERYTHROBLASTS AND MYELOCYTES

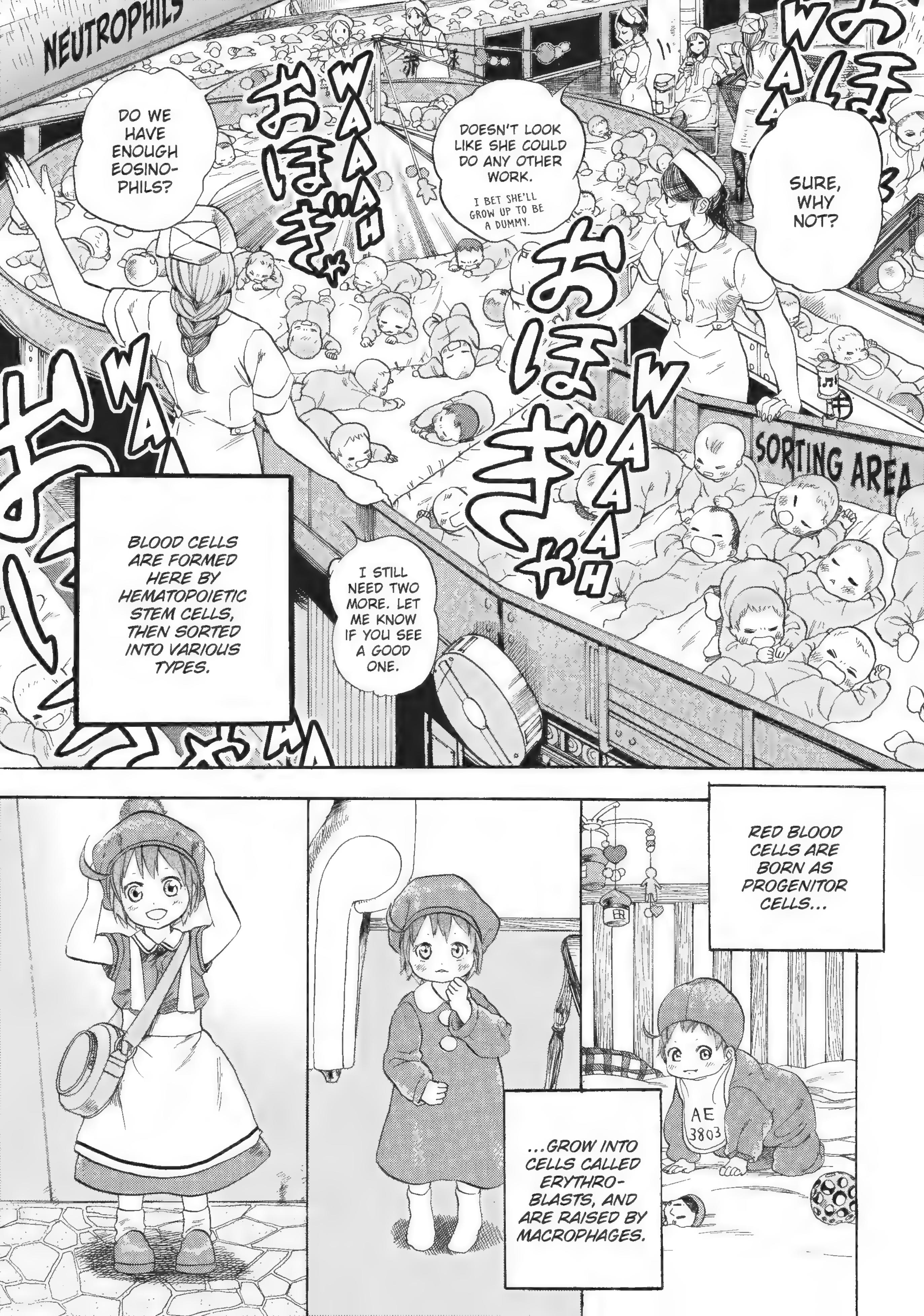
WOW!!
わい
HUSTLE
02

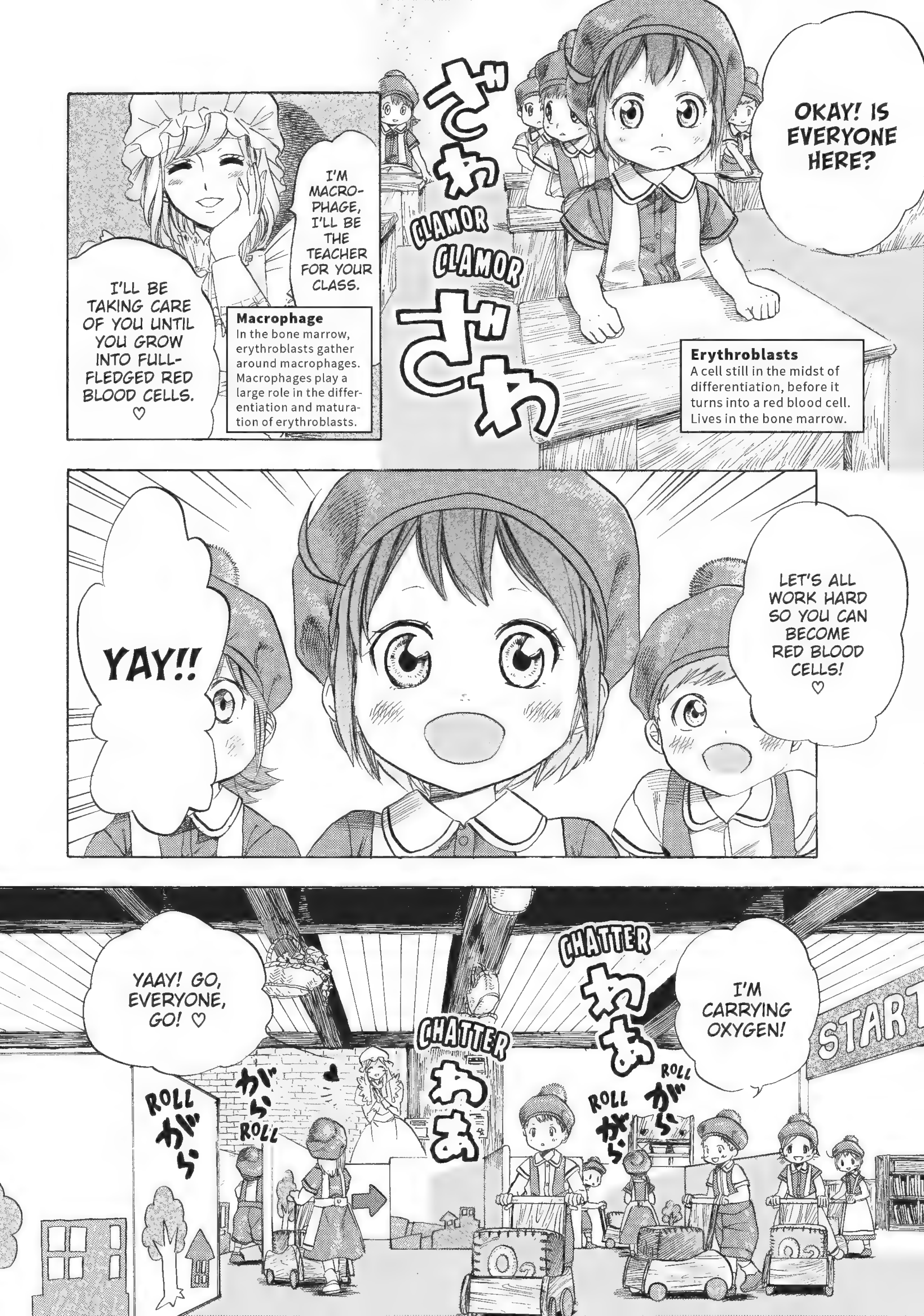

わい
HUSTLE
BUSTLE
わい
IT'S THE RED BONE MARROW!!


THE RED BONE MARROW IS THE HOME OF BLOOD CELLS.
BRINGS BACK MEMORIES.
EEEEEK
WAAAAAH
BWAAAAAH
WAAAAH
BLOOD CELLS ARE BORN HERE AND SPEND THEIR EARLY CHILDHOOD HERE.
I WAS HERE ONCE, TOO...
WAAAAH
WAAAAH
WAAAH
WE'VE GOT ANOTHER PROGENITOR CELL BORN!
W AE Red Hazel
3803
SHOULD THIS ONE BE...A RED BLOOD CELL?
SHE DOES HAVE RED HAIR.
WELL...
おぎゃあ
WAAAH
BWAAAAAA
ほぎゃあ
BWAAA
んぎゃあ
おぎゃあ
WAAAAH

Progenitor Cell
A cell that has not yet differentiated from a stem cell to a specific cell type.

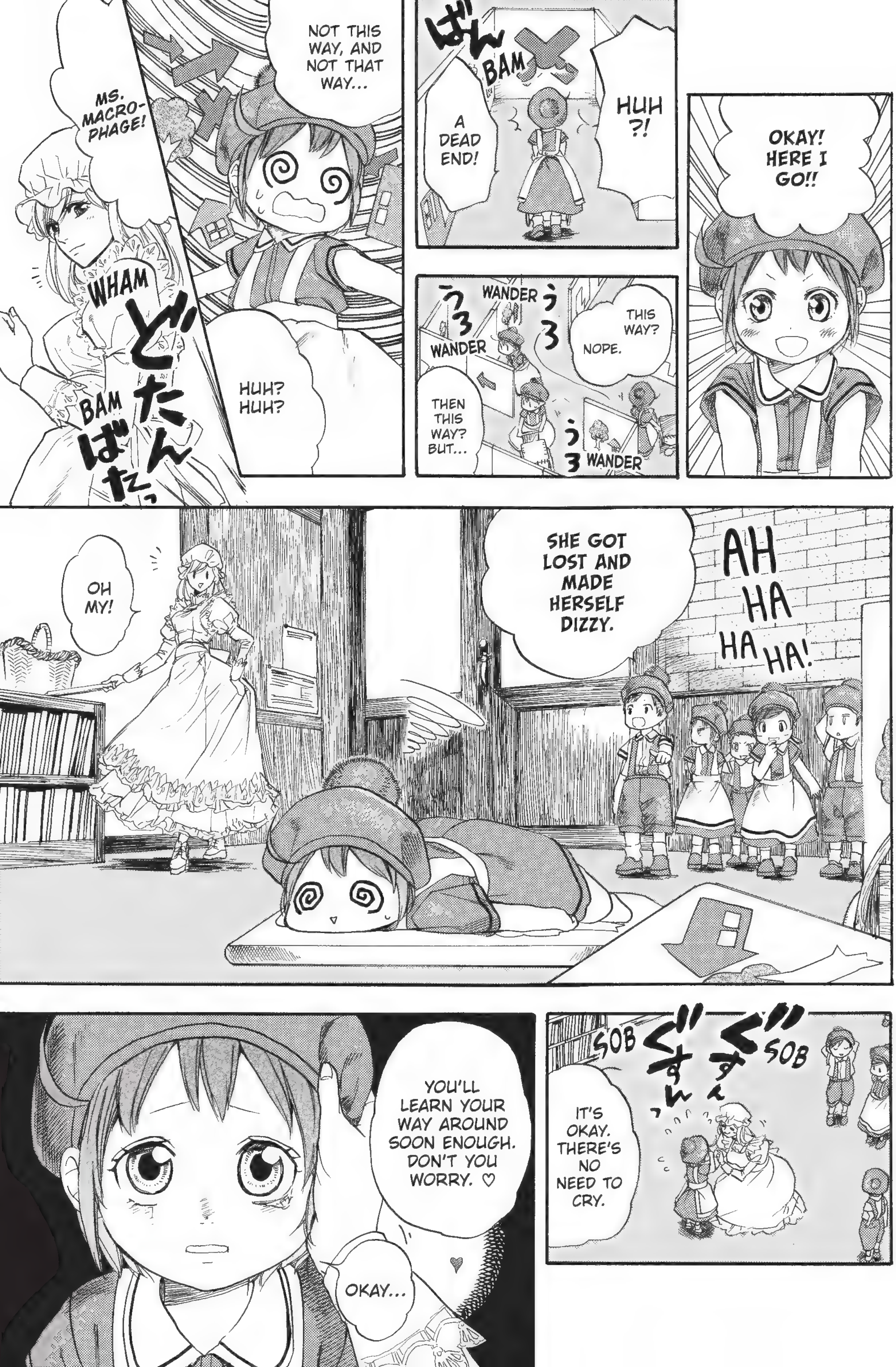
Hematopoietic Stem Cell
Makes blood cells such as red blood cells, white blood cells, and platelets.

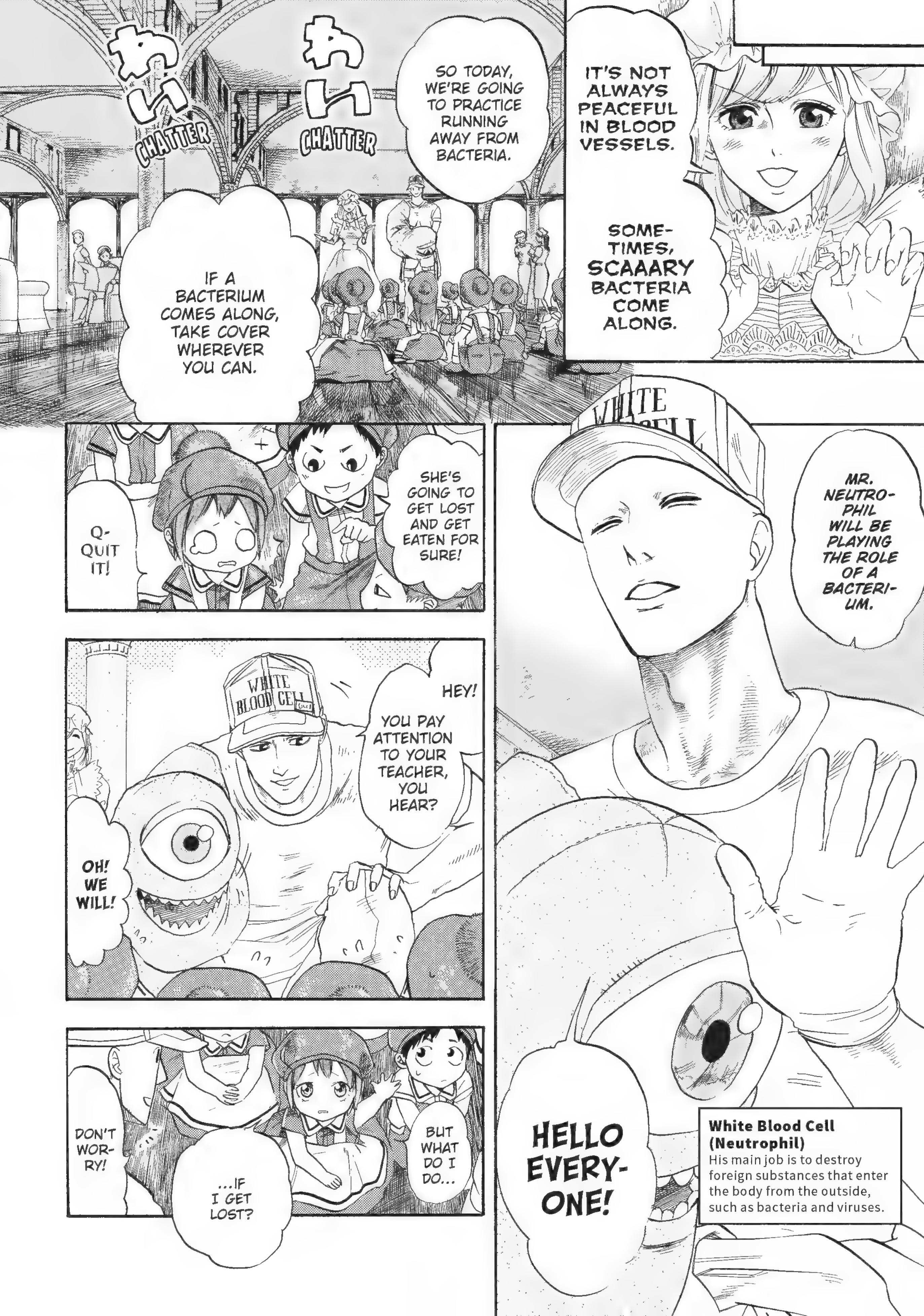
NEUTROPHILS
SORTING AREA
WAAH
SURE, WHY NOT?
おぎゃ WAAAAH
DOESN'T LOOK LIKE SHE COULD DO ANY OTHER WORK.
I BET SHE'LL GROW UP TO BE A DUMMY.
おぎゃ WAAAH
DO WE HAVE ENOUGH EOSINOPHILS?
I STILL NEED TWO MORE. LET ME KNOW IF YOU SEE A GOOD ONE.
BLOOD CELLS ARE FORMED HERE BY HEMATOPOIETIC STEM CELLS, THEN SORTED INTO VARIOUS TYPES.
WAA
RED BLOOD CELLS ARE BORN AS PROGENITOR CELLS...
AE 3803
...GROW INTO CELLS CALLED ERYTHROBLASTS, AND ARE RAISED BY MACROPHAGES.


OKAY! IS EVERYONE HERE?
ざわ CLAMOR
CLAMOR ざわ
I'M MACROPHAGE, I'LL BE THE TEACHER FOR YOUR CLASS.
I'LL BE TAKING CARE OF YOU UNTIL YOU GROW INTO FULL-FLEDGED RED BLOOD CELLS. ♡
LET'S ALL WORK HARD SO YOU CAN BECOME RED BLOOD CELLS! ♡
YAY!!
CHATTER わあ
I'M CARRYING OXYGEN!
CHATTER わあ
YAAY! GO, EVERYONE, GO! ♡
ROLL がら
ROLL がら
ROLL がら
ROLL がら
START
O2

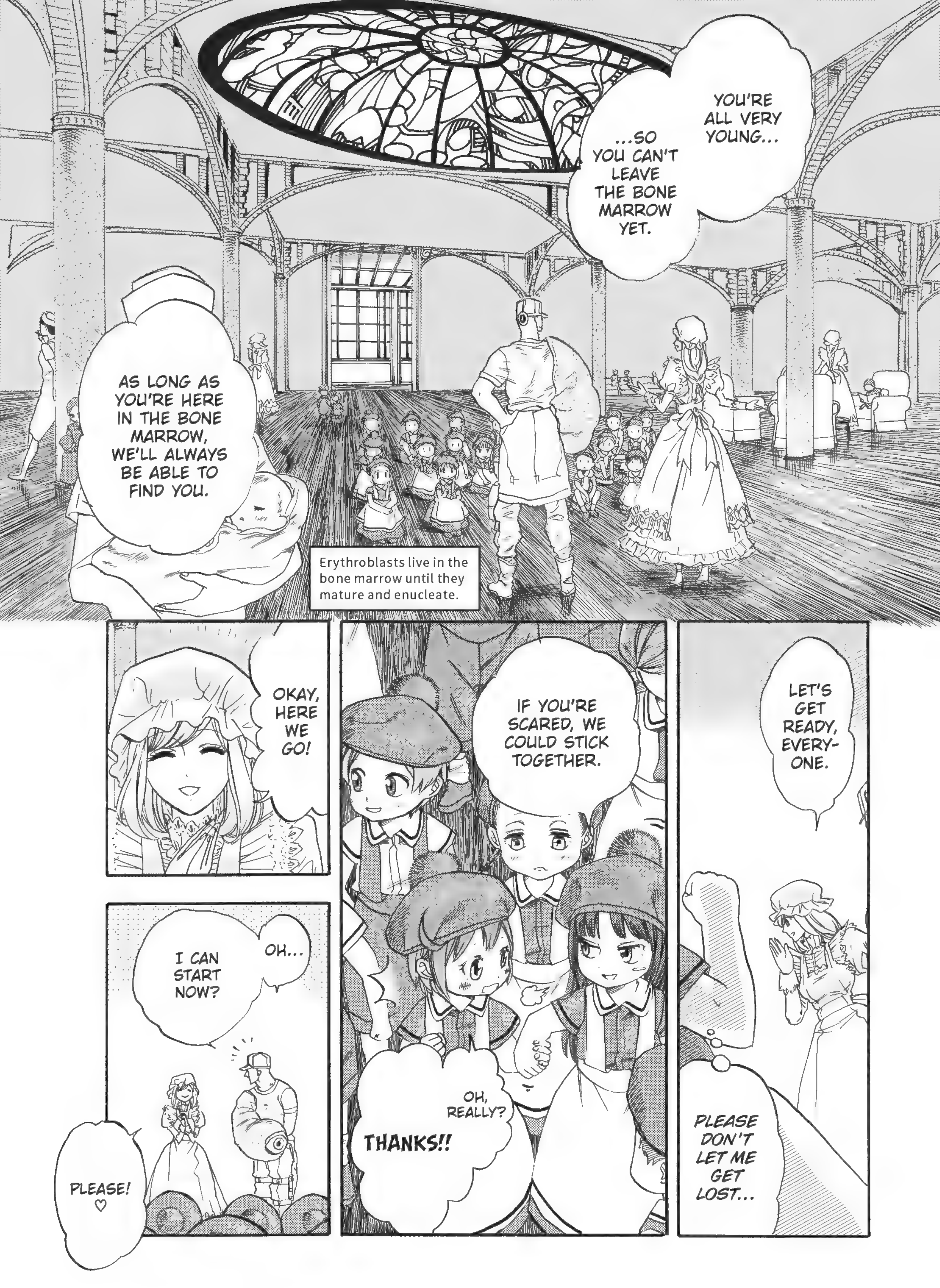
Erythroblasts
A cell still in the midst of differentiation, before it turns into a red blood cell. Lives in the bone marrow.

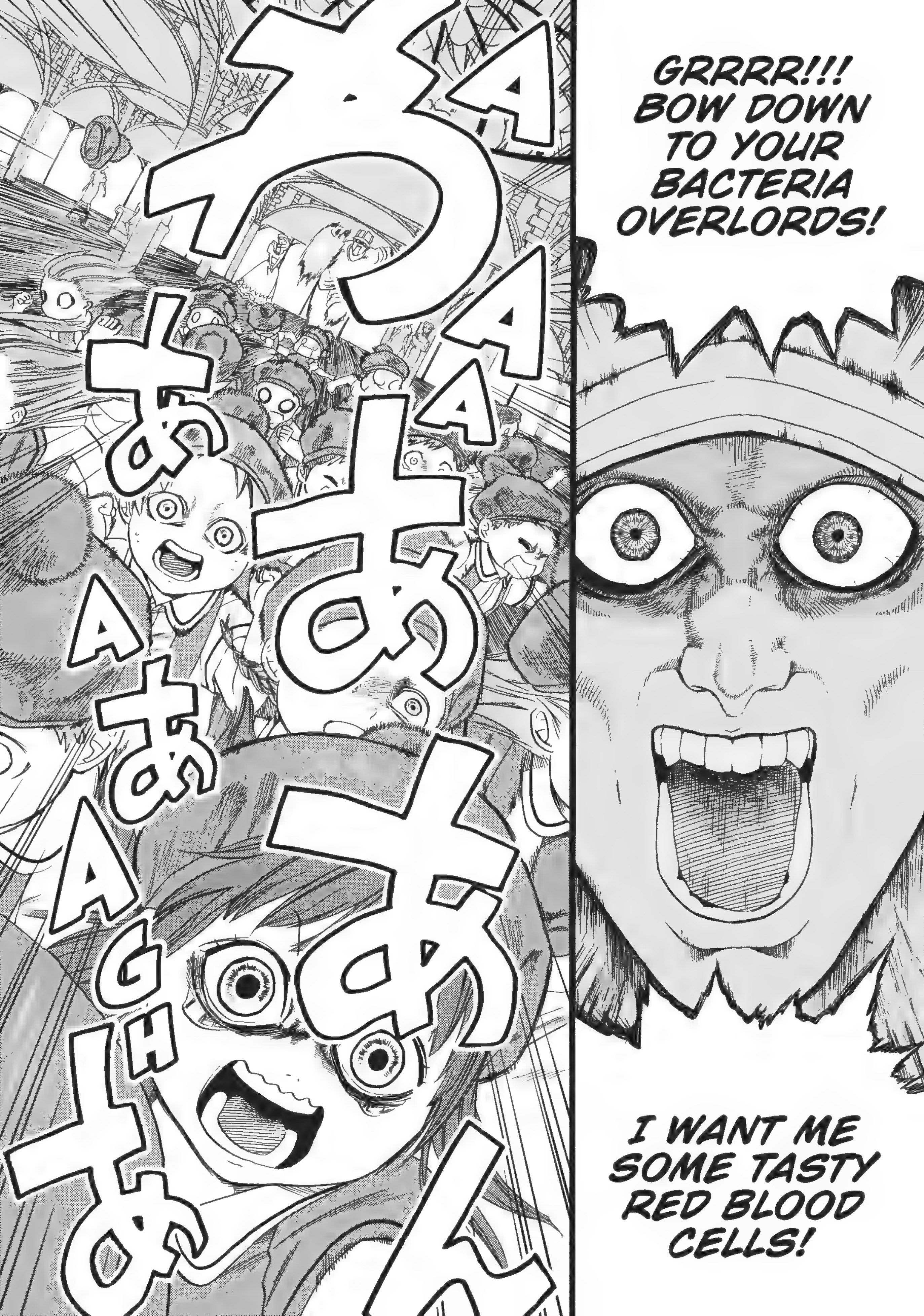
Macrophage
In the bone marrow, erythroblasts gather around macrophages. Macrophages play a large role in the differentiation and maturation of erythroblasts.

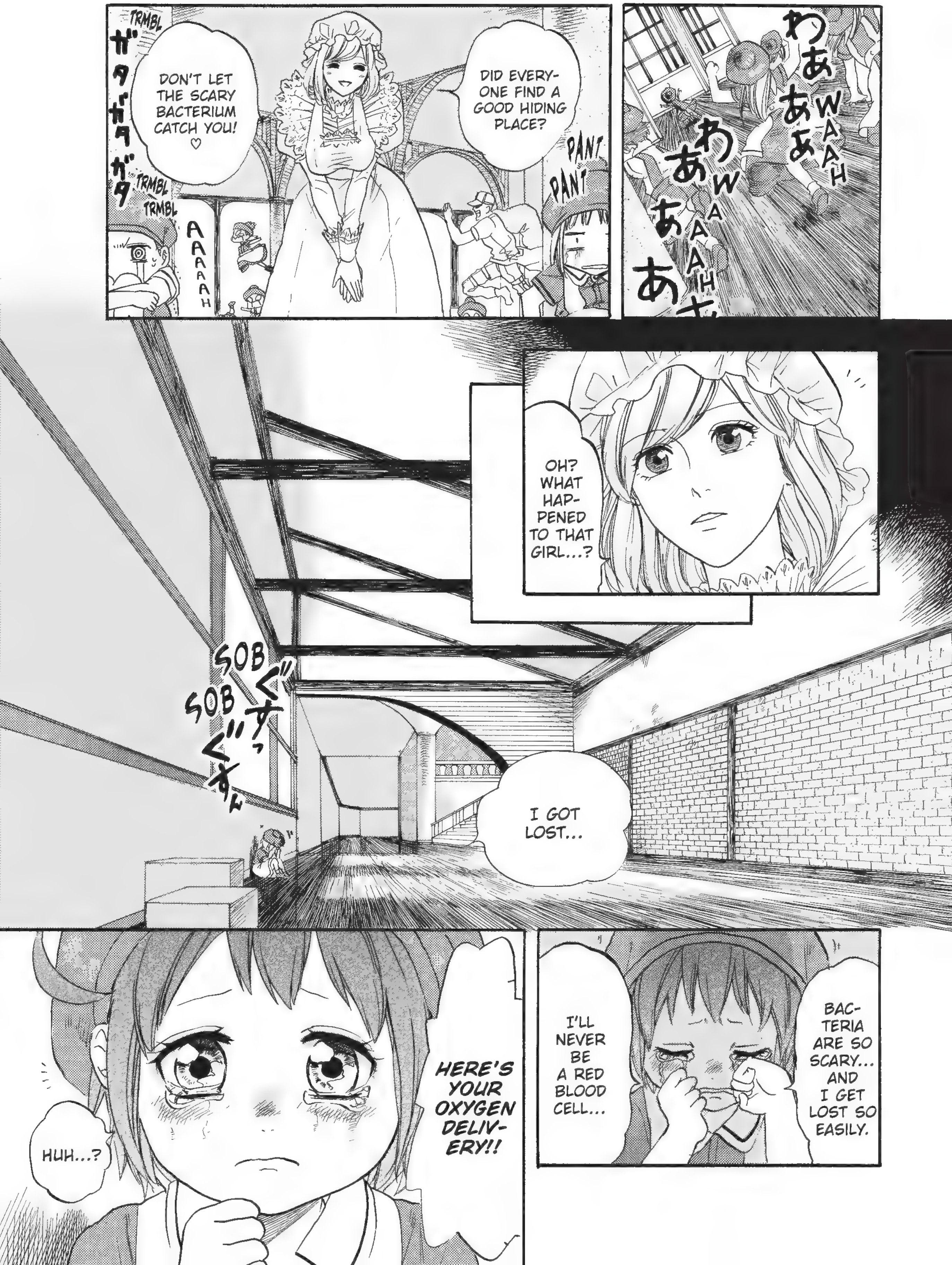

OKAY! HERE I GO!!
ばん
BAM
HUH ?!
A DEAD END!
うろ
WANDER
THIS WAY?
NOPE.
うろ
WANDER
THEN THIS WAY? BUT...
うろ
WANDER
NOT THIS WAY, AND NOT THAT WAY...
MS. MACROPHAGE!
HUH? HUH?
どたん
WHAM
ばたっ
BAM
AH HA HA HA!
SHE GOT LOST AND MADE HERSELF DIZZY.
OH MY!
ぐすん
SOB
ぐすん
SOB
IT'S OKAY. THERE'S NO NEED TO CRY.
YOU'LL LEARN YOUR WAY AROUND SOON ENOUGH. DON'T YOU WORRY. ♡
OKAY...

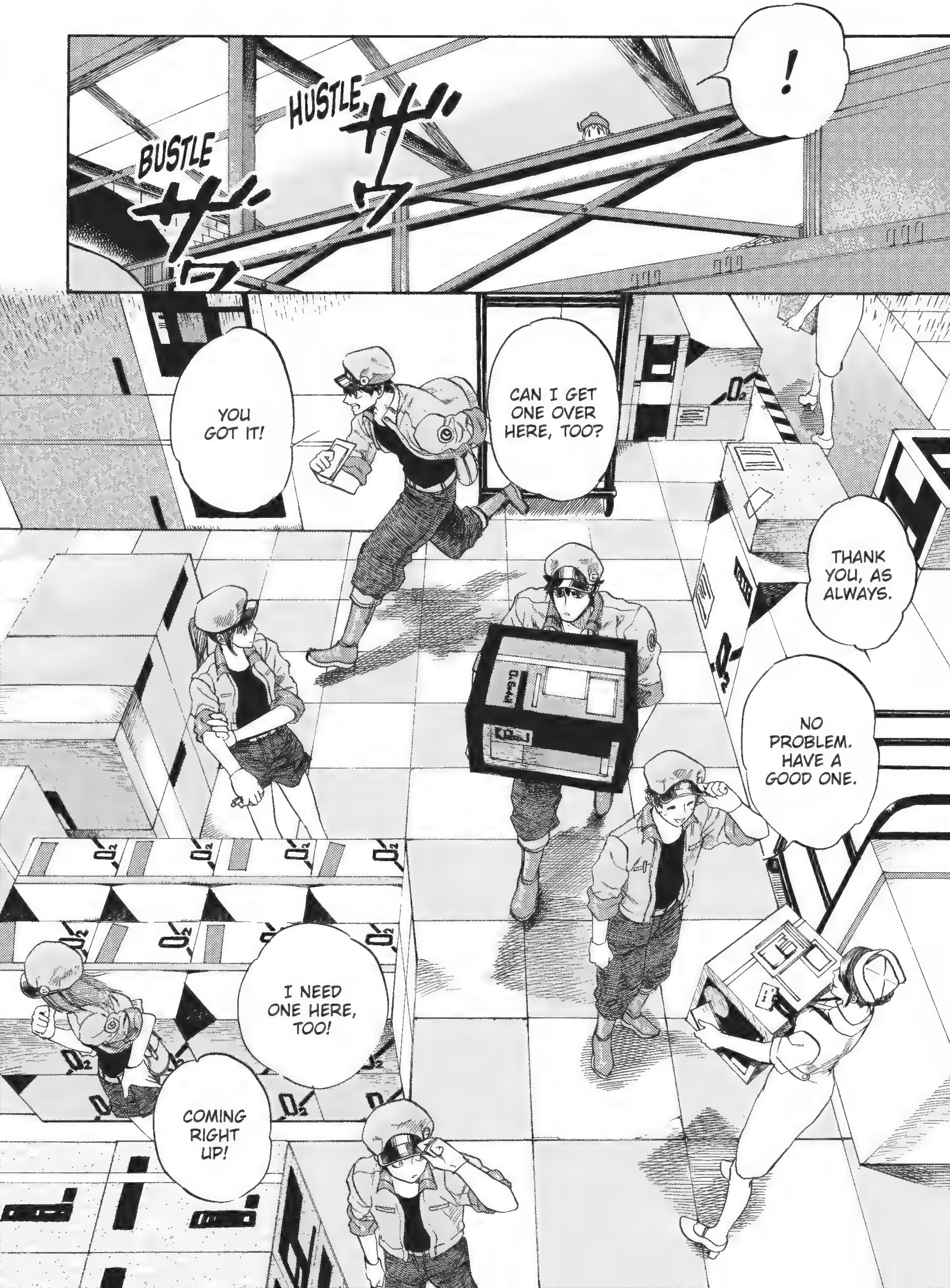

IT'S NOT ALWAYS PEACEFUL IN BLOOD VESSELS.
SOMETIMES, SCAAARY BACTERIA COME ALONG.
SO TODAY, WE'RE GOING TO PRACTICE RUNNING AWAY FROM BACTERIA.
わい CHATTER
わい CHATTER
IF A BACTERIUM COMES ALONG, TAKE COVER WHEREVER YOU CAN.
MR. NEUTROPHIL WILL BE PLAYING THE ROLE OF A BACTERIUM.
HELLO EVERYONE!
SHE'S GOING TO GET LOST AND GET EATEN FOR SURE!
Q-QUIT IT!
HEY!
YOU PAY ATTENTION TO YOUR TEACHER, YOU HEAR?
OH! WE WILL!
BUT WHAT DO I DO...
...IF I GET LOST?
DON'T WORRY!

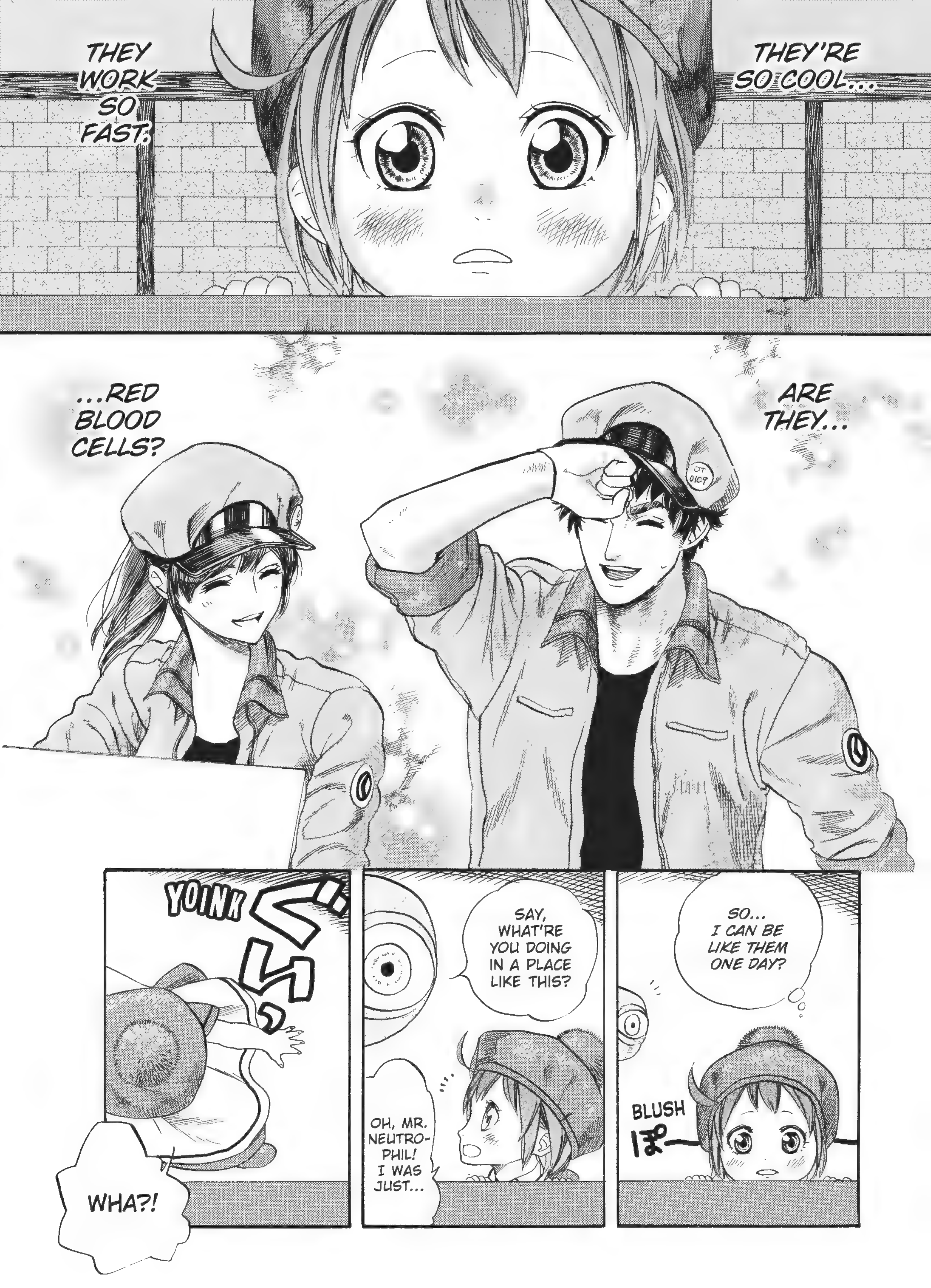
White Blood Cell (Neutrophil)
His main job is to destroy foreign substances that enter the body from the outside, such as bacteria and viruses.

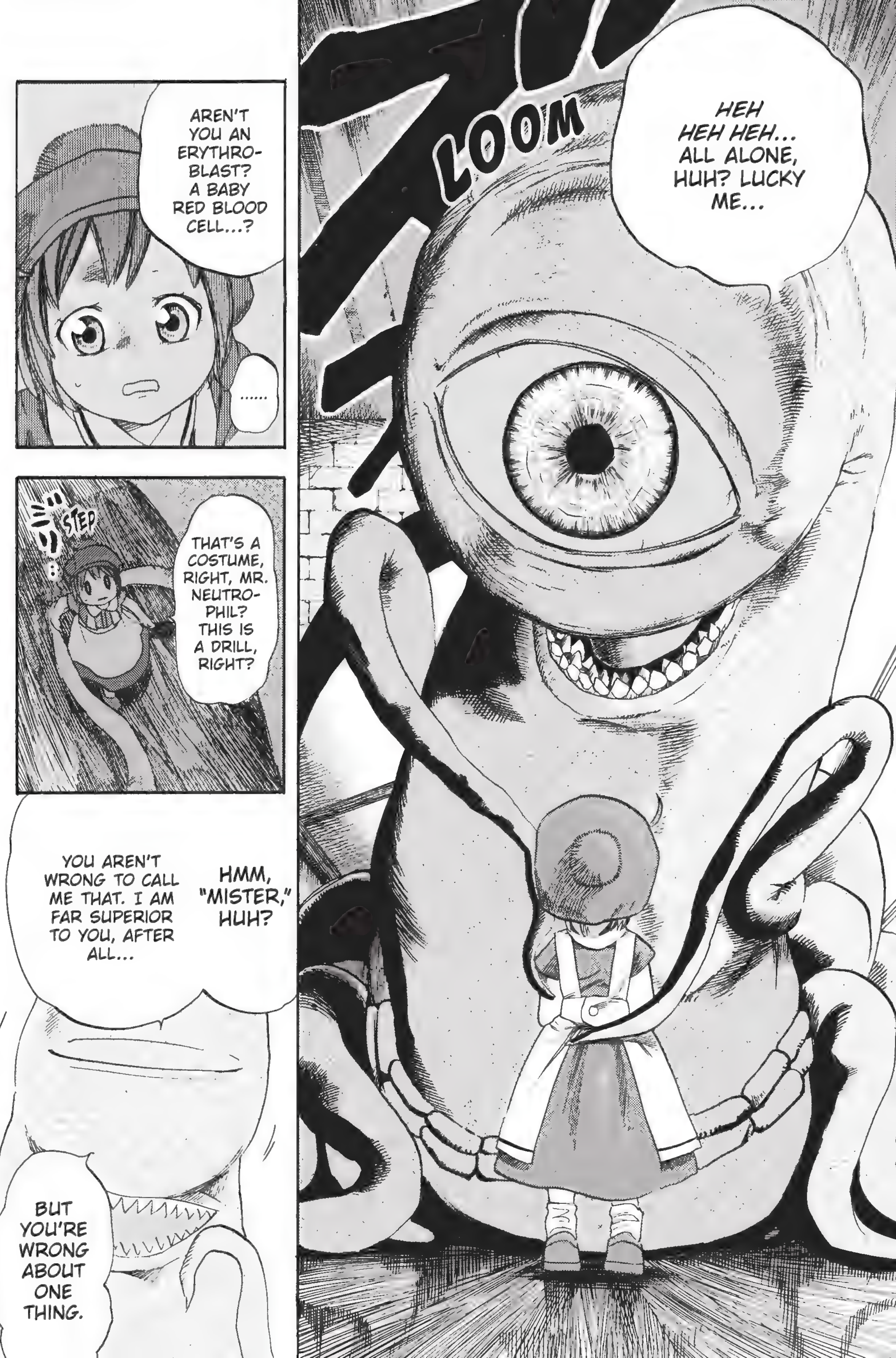

YOU'RE ALL VERY YOUNG...
...SO YOU CAN'T LEAVE THE BONE MARROW YET.
AS LONG AS YOU'RE HERE IN THE BONE MARROW, WE'LL ALWAYS BE ABLE TO FIND YOU.
Erythroblasts live in the bone marrow until they mature and enucleate.
LET'S GET READY, EVERY-ONE.
PLEASE DON'T LET ME GET LOST...
IF YOU'RE SCARED, WE COULD STICK TOGETHER.
OH, REALLY?
THANKS!!
OKAY, HERE WE GO!
OH...
I CAN START NOW?
PLEASE! ♡

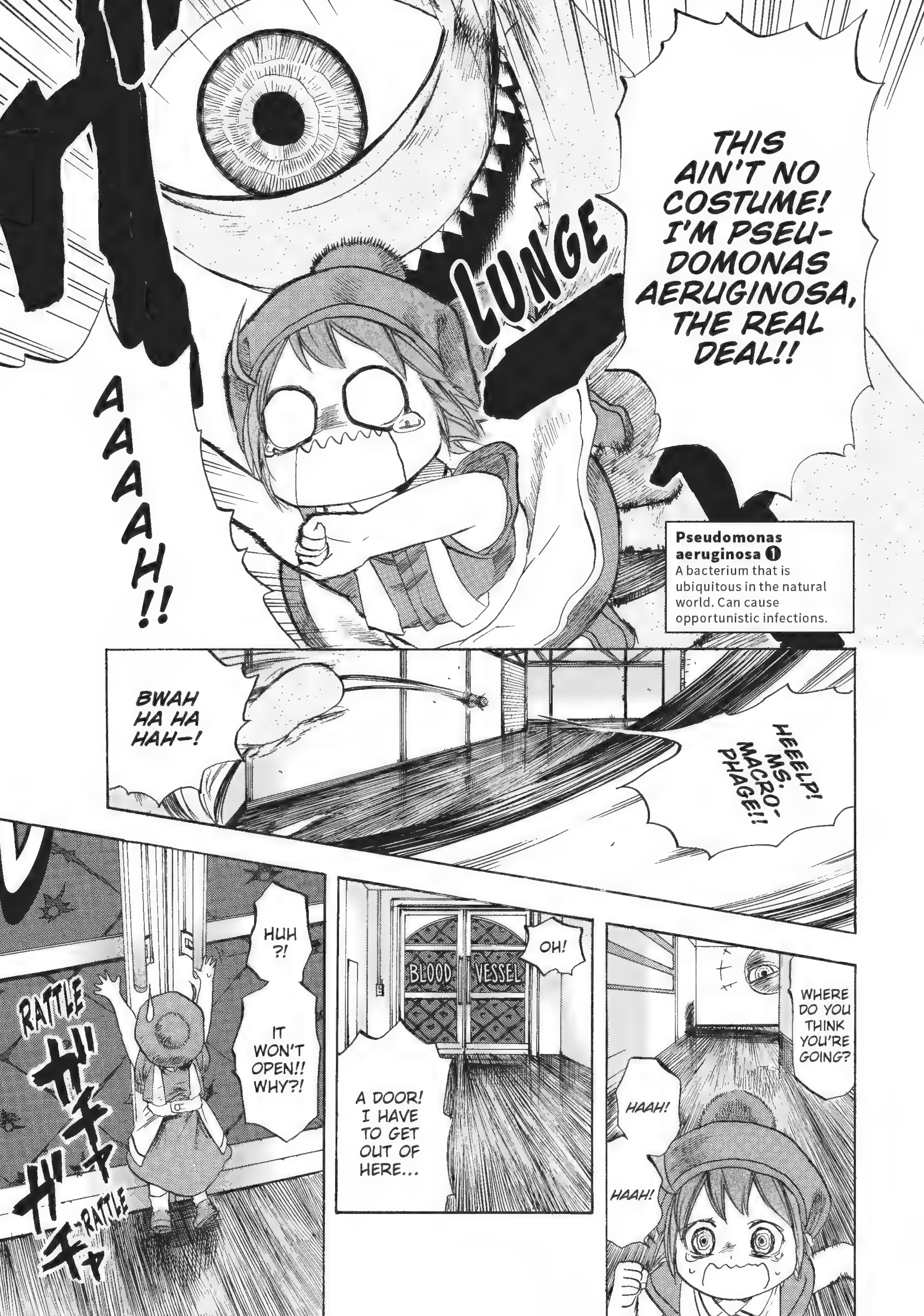

GRRRR!!! BOW DOWN TO YOUR BACTERIA OVERLORDS!
I WANT ME SOME TASTY RED BLOOD CELLS!
うああん
あああ
AAAAAGH


わあ
ああ
わあ
あ
あ
WAAH
WAAAAH
DID EVERY-ONE FIND A GOOD HIDING PLACE?
DON'T LET THE SCARY BACTERIUM CATCH YOU! ♡
PANT PANT
TRMBL
ガタガタ
ガタ
TRMBL TRMBL
AAAAAAH
OH? WHAT HAP-PENED TO THAT GIRL...?
SOB SOB
ぐずっ
ぐずん
I GOT LOST...
BAC-TERIA ARE SO SCARY... AND I GET LOST SO EASILY.
I'LL NEVER BE A RED BLOOD CELL...
HERE'S YOUR OXYGEN DELIV-ERY!!
HUH...?

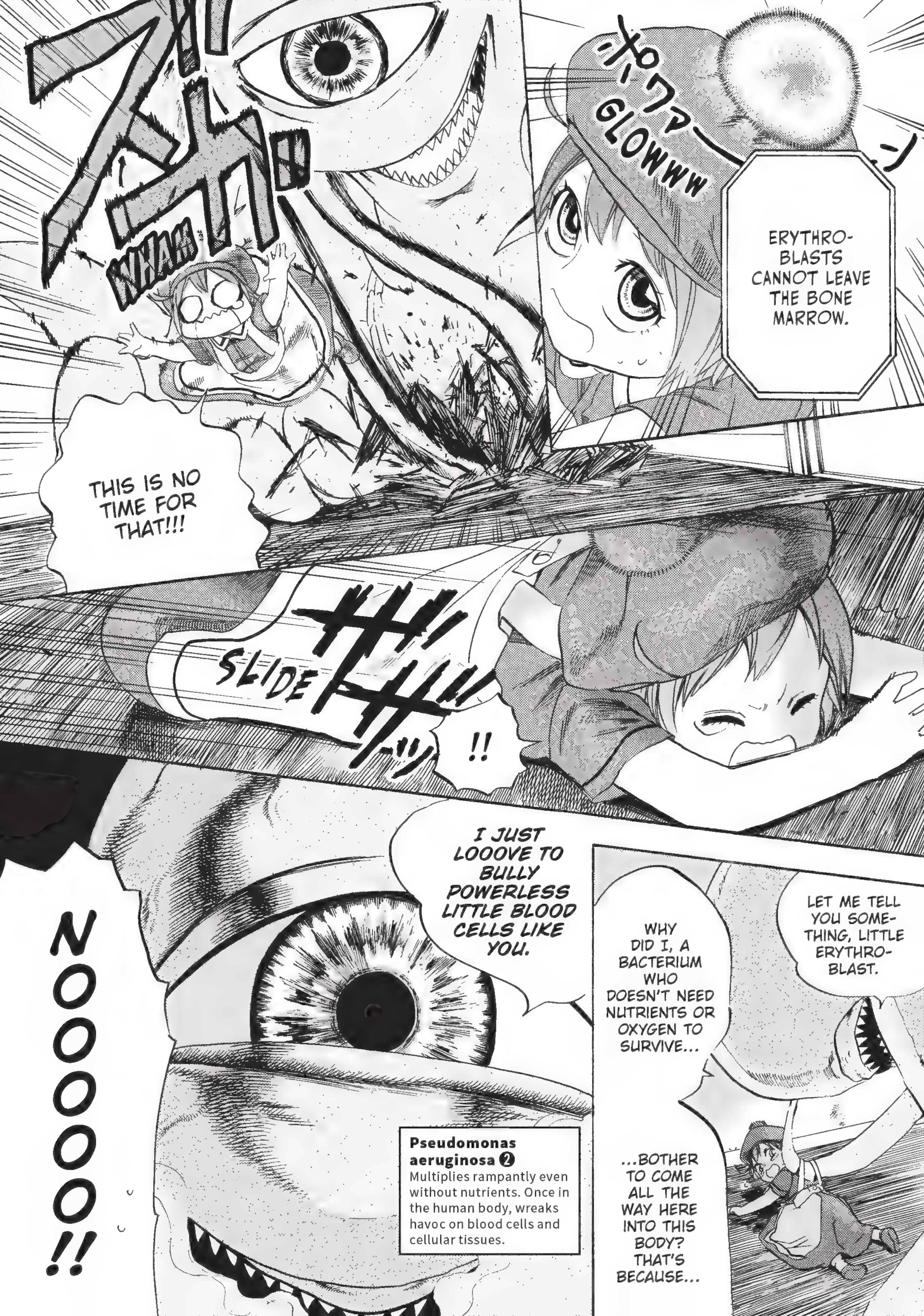

!
HUSTLE
ザワ
BUSTLE
ザワ
CAN I GET ONE OVER HERE, TOO?
YOU GOT IT!
THANK YOU, AS ALWAYS.
NO PROBLEM. HAVE A GOOD ONE.
I NEED ONE HERE, TOO!
COMING RIGHT UP!


THEY'RE SO COOL...
THEY WORK SO FAST.
ARE THEY...
...RED BLOOD CELLS?
SO... I CAN BE LIKE THEM ONE DAY?
BLUSH
ぽー
SAY, WHAT'RE YOU DOING IN A PLACE LIKE THIS?
OH, MR. NEUTROPHIL! I WAS JUST...
YOINK
ぐいっ
WHA?!

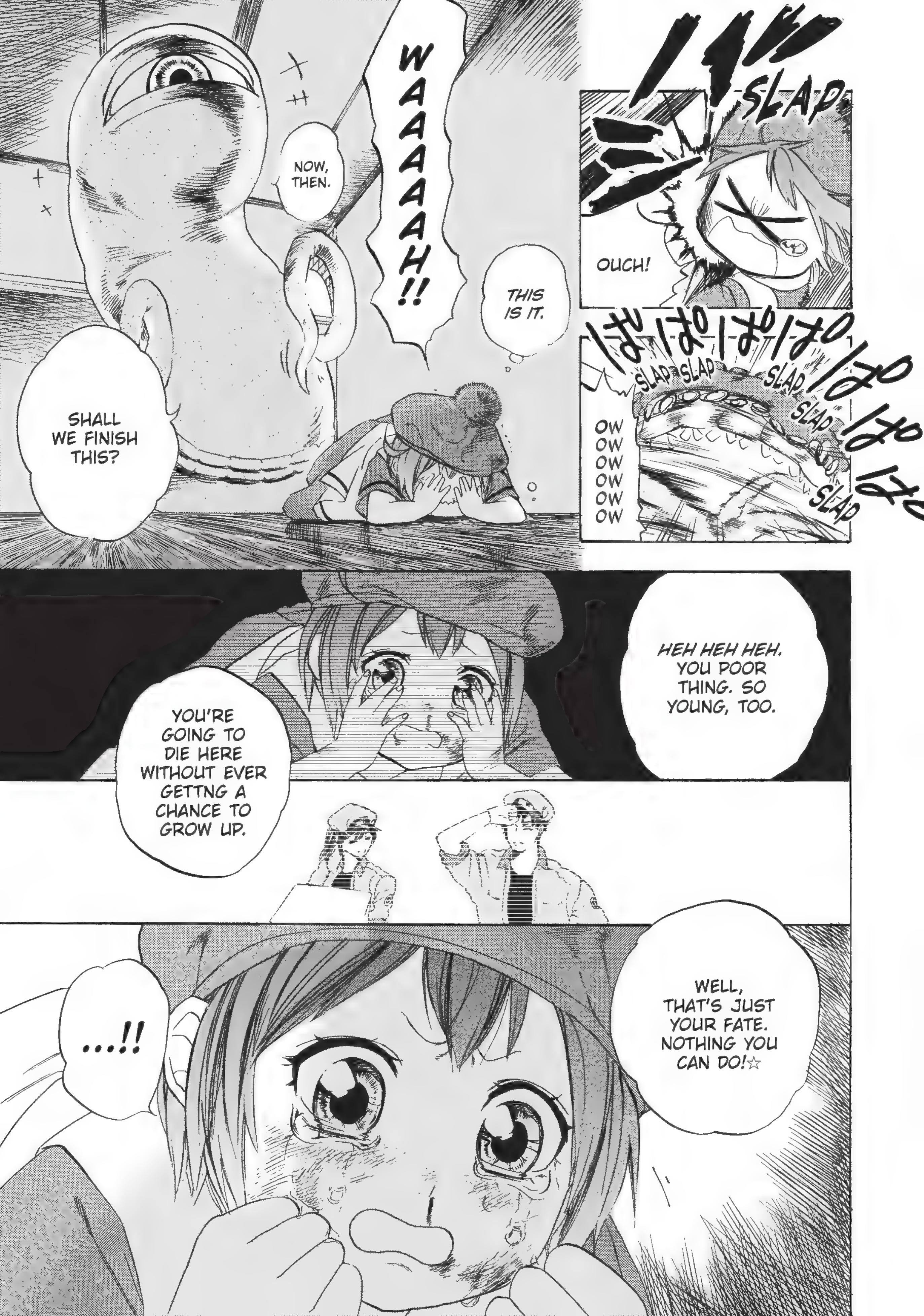

LOOM
HEH HEH HEH... ALL ALONE, HUH? LUCKY ME...
AREN'T YOU AN ERYTHROBLAST? A BABY RED BLOOD CELL...?
......
STEP
THAT'S A COSTUME, RIGHT, MR. NEUTROPHIL? THIS IS A DRILL, RIGHT?
HMM, "MISTER," HUH?
YOU AREN'T WRONG TO CALL ME THAT. I AM FAR SUPERIOR TO YOU, AFTER ALL...
BUT YOU'RE WRONG ABOUT ONE THING.

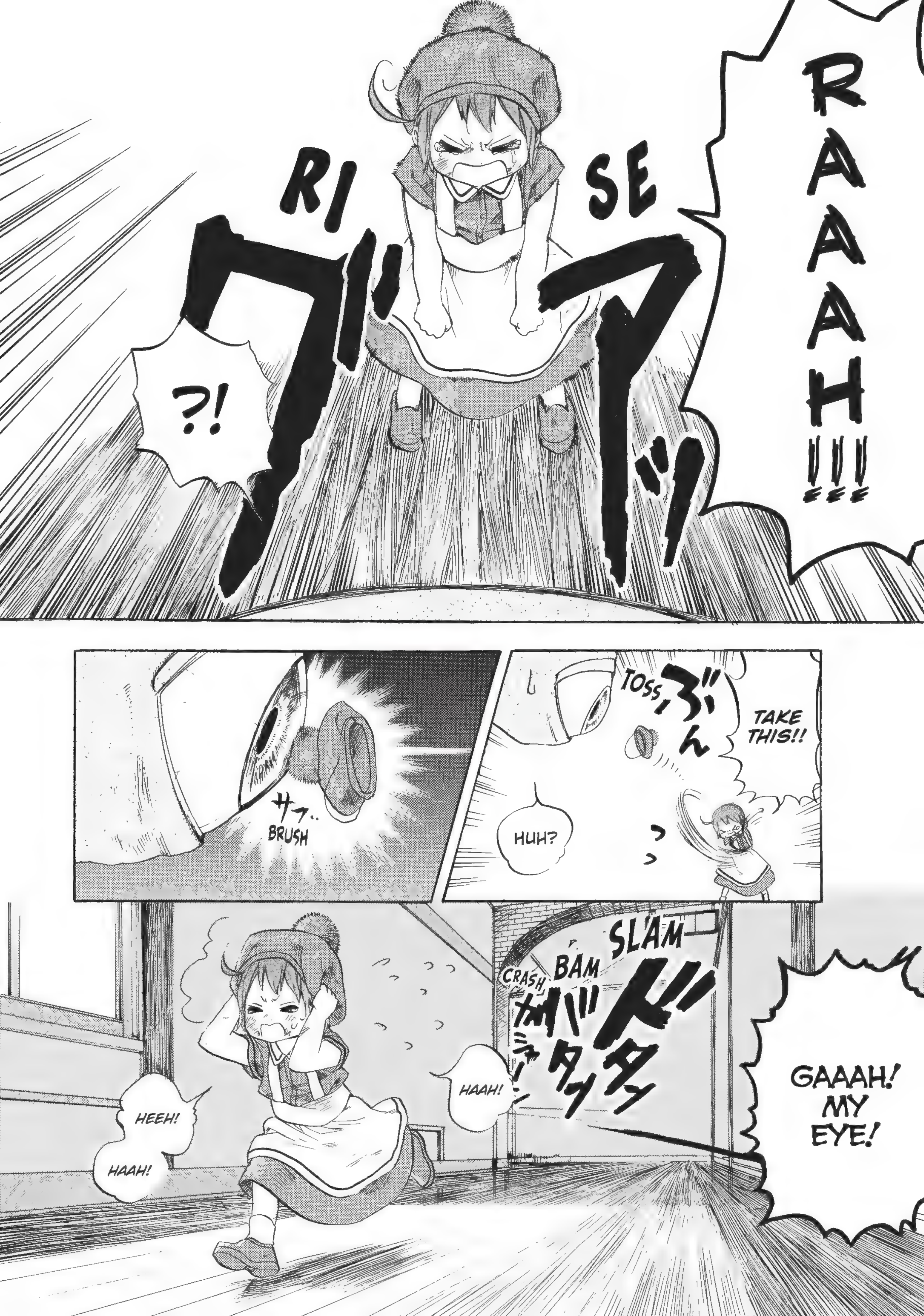

THIS AIN'T NO COSTUME! I'M PSEUDOMONAS AERUGINOSA, THE REAL DEAL!!
LUNGE
AAAAAAH!!
HEEELP! MS. MACROPHAGE!!
BWAH HA HA HAH—!
WHERE DO YOU THINK YOU'RE GOING?
HAAH!
HAAH!
OH!
BLOOD VESSEL
A DOOR! I HAVE TO GET OUT OF HERE...
HUH?!
IT WON'T OPEN!! WHY?!
RATTLE
ガチャガチャ
RATTLE

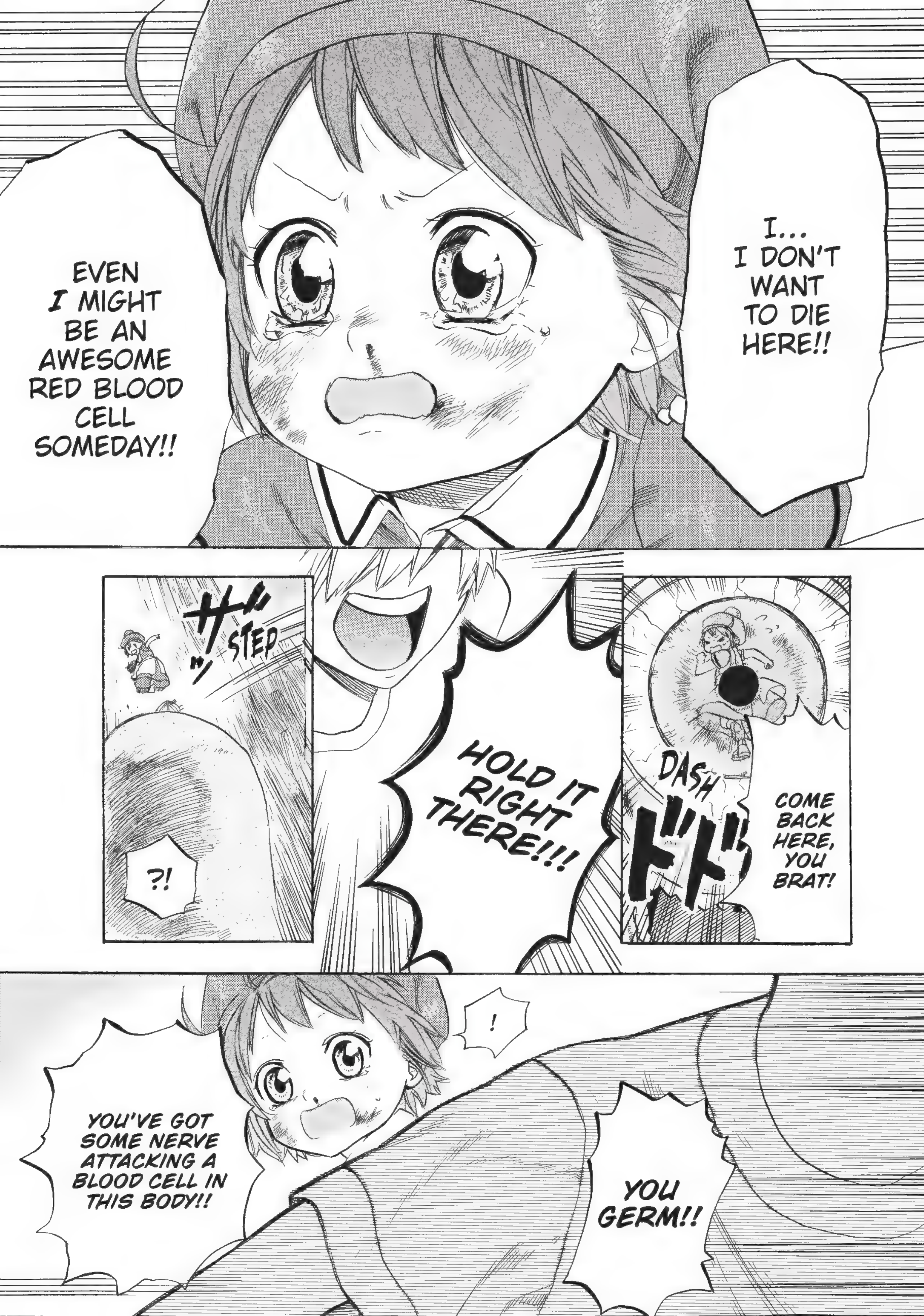
Pseudomonas aeruginosa ①
A bacterium that is ubiquitous in the natural world. Can cause opportunistic infections.

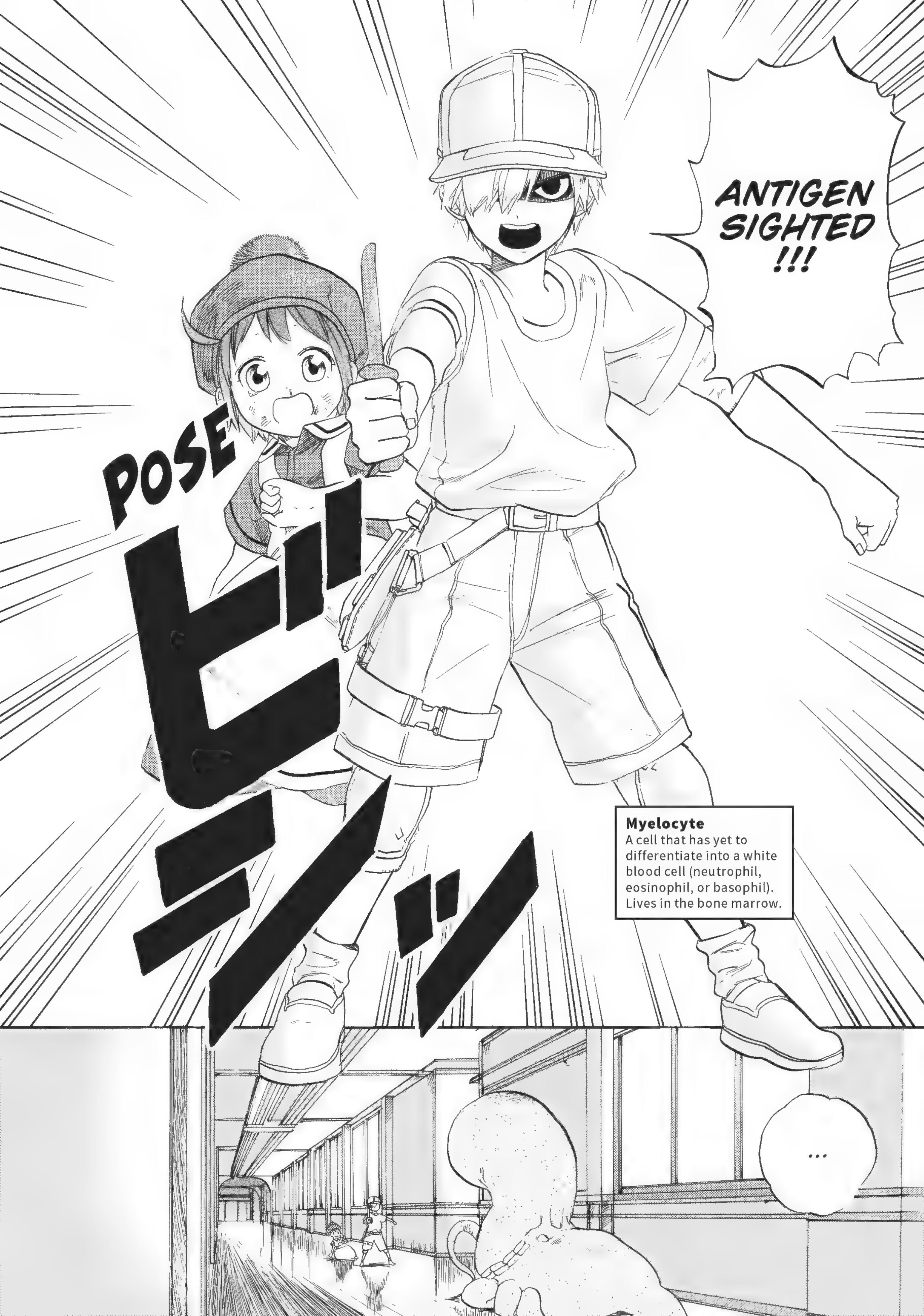

ポワァー
GLOWWW
ERYTHROBLASTS CANNOT LEAVE THE BONE MARROW.
ズバッ!!
WHAM
THIS IS NO TIME FOR THAT!!!
SLIDE
!!
LET ME TELL YOU SOMETHING, LITTLE ERYTHROBLAST.
WHY DID I, A BACTERIUM WHO DOESN'T NEED NUTRIENTS OR OXYGEN TO SURVIVE...
...BOTHER TO COME ALL THE WAY HERE INTO THIS BODY? THAT'S BECAUSE...
I JUST LOOOVE TO BULLY POWERLESS LITTLE BLOOD CELLS LIKE YOU.
NOOOOOOO!!

Pseudomonas aeruginosa ❷
Multiplies rampantly even without nutrients. Once in the human body, wreaks havoc on blood cells and cellular tissues.

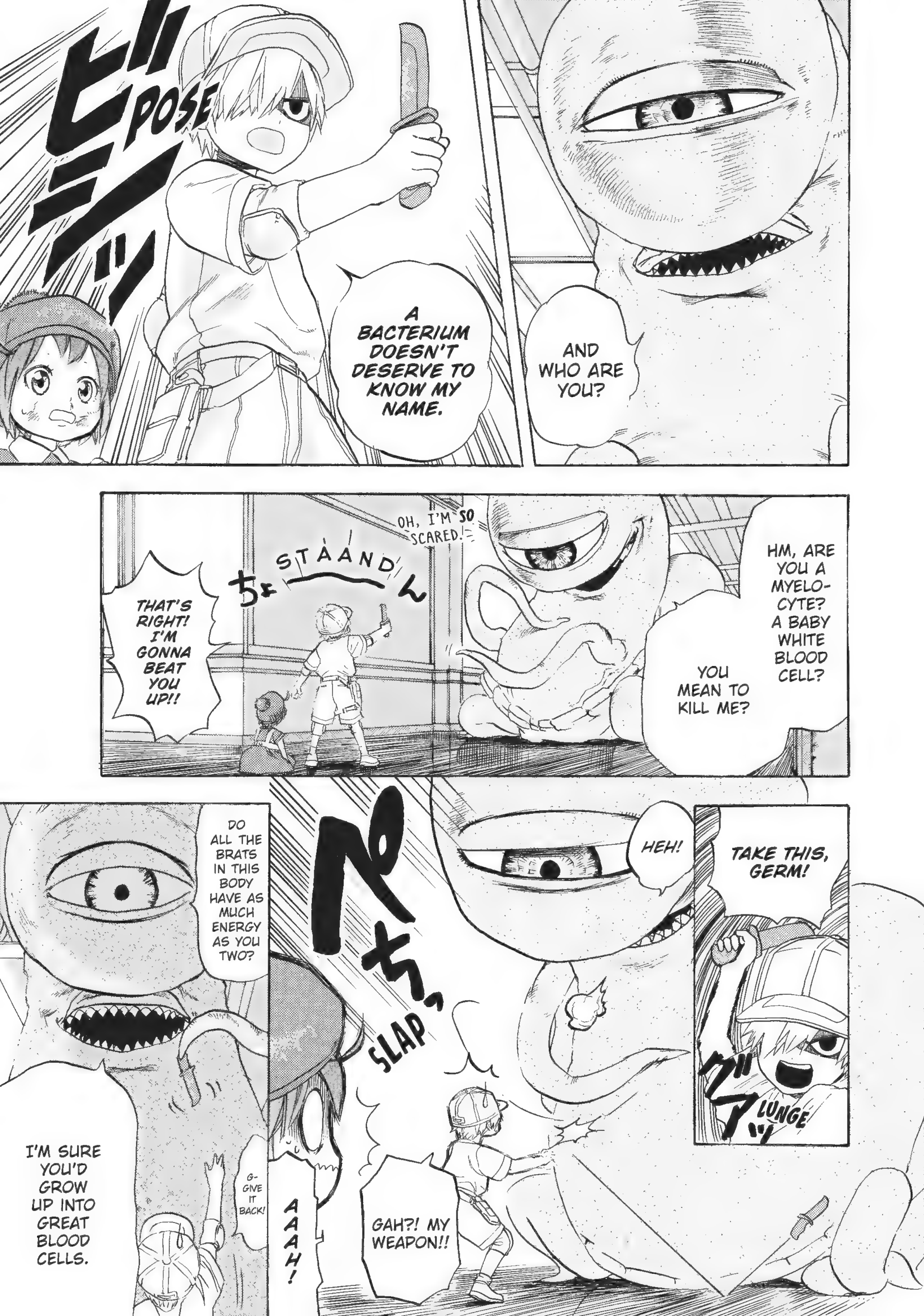

SLAP
OUCH!
ぱぱぱぱぱぱぱ
SLAP SLAP SLAP SLAP SLAP
OW OW OW OW OW OW
WAAAAAAAH!!
NOW, THEN.
THIS IS IT.
SHALL WE FINISH THIS?
HEH HEH HEH. YOU POOR THING. SO YOUNG, TOO.
YOU'RE GOING TO DIE HERE WITHOUT EVER GETTNG A CHANCE TO GROW UP.
WELL, THAT'S JUST YOUR FATE. NOTHING YOU CAN DO!☆
...!!

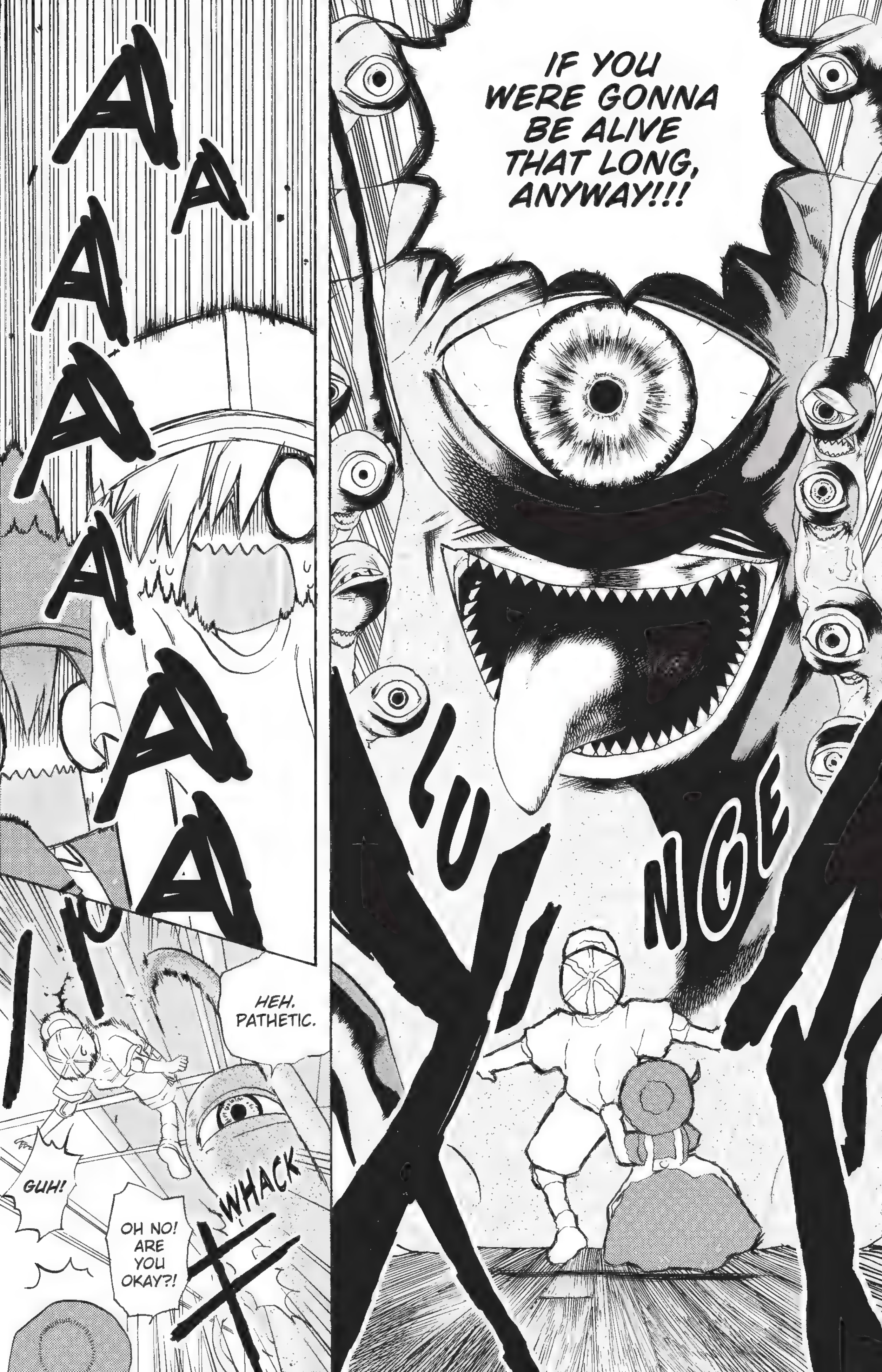

RAAAAH!!!
RI SE
ガバッ
?!
TOSS
ぶん
TAKE THIS!!
HUH?
サッ
BRUSH
GAAAH! MY EYE!
SLAM
ドタタッ
BAM
バタ
CRASH
ガシャ!
HAAH!
HEEH!
HAAH!

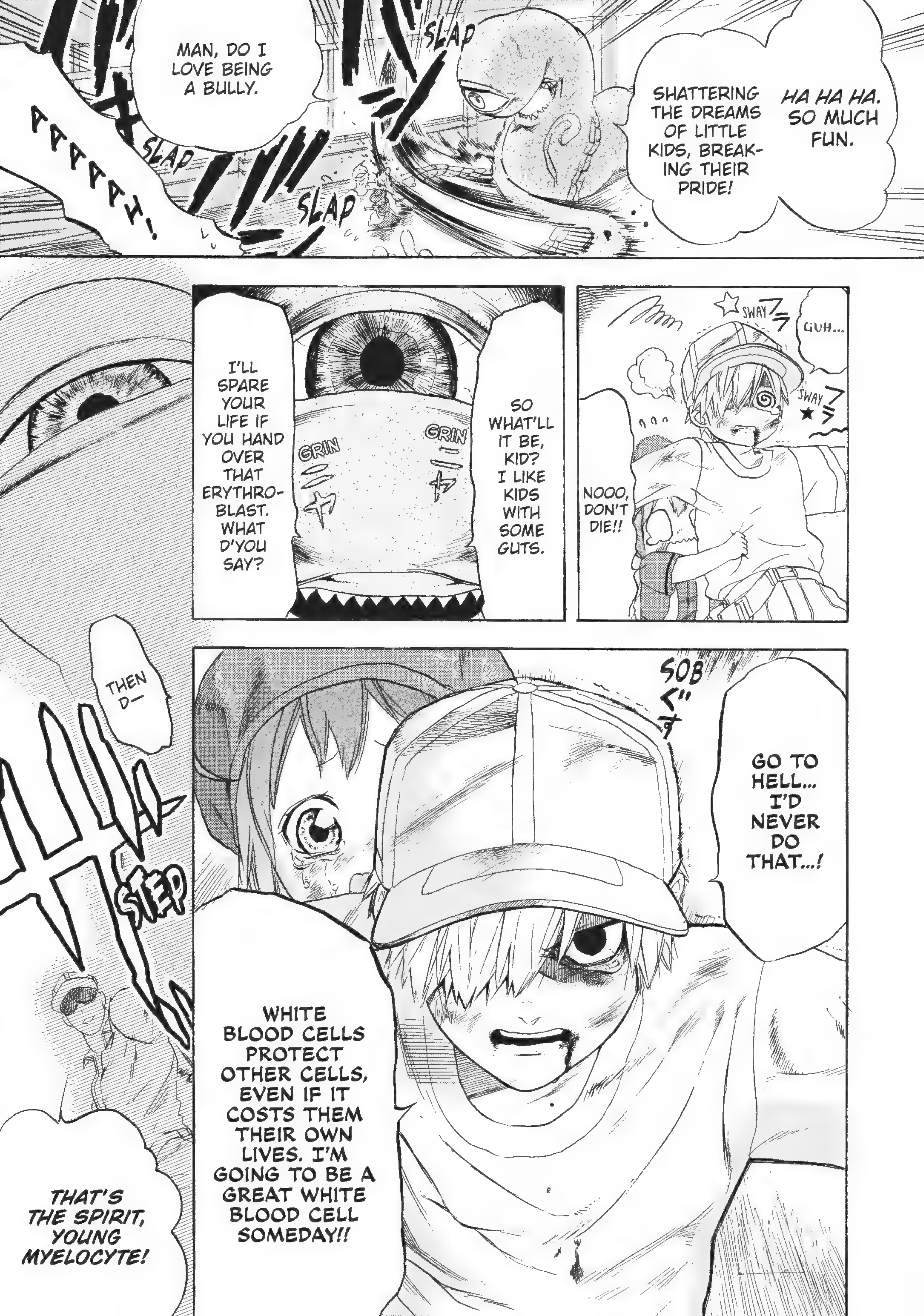

I... I DON'T WANT TO DIE HERE!!
EVEN I MIGHT BE AN AWESOME RED BLOOD CELL SOMEDAY!!
COME BACK HERE, YOU BRAT!
DASH
ドド
HOLD IT RIGHT THERE!!!
ザッ
STEP
?!
!
YOU GERM!!
YOU'VE GOT SOME NERVE ATTACKING A BLOOD CELL IN THIS BODY!!

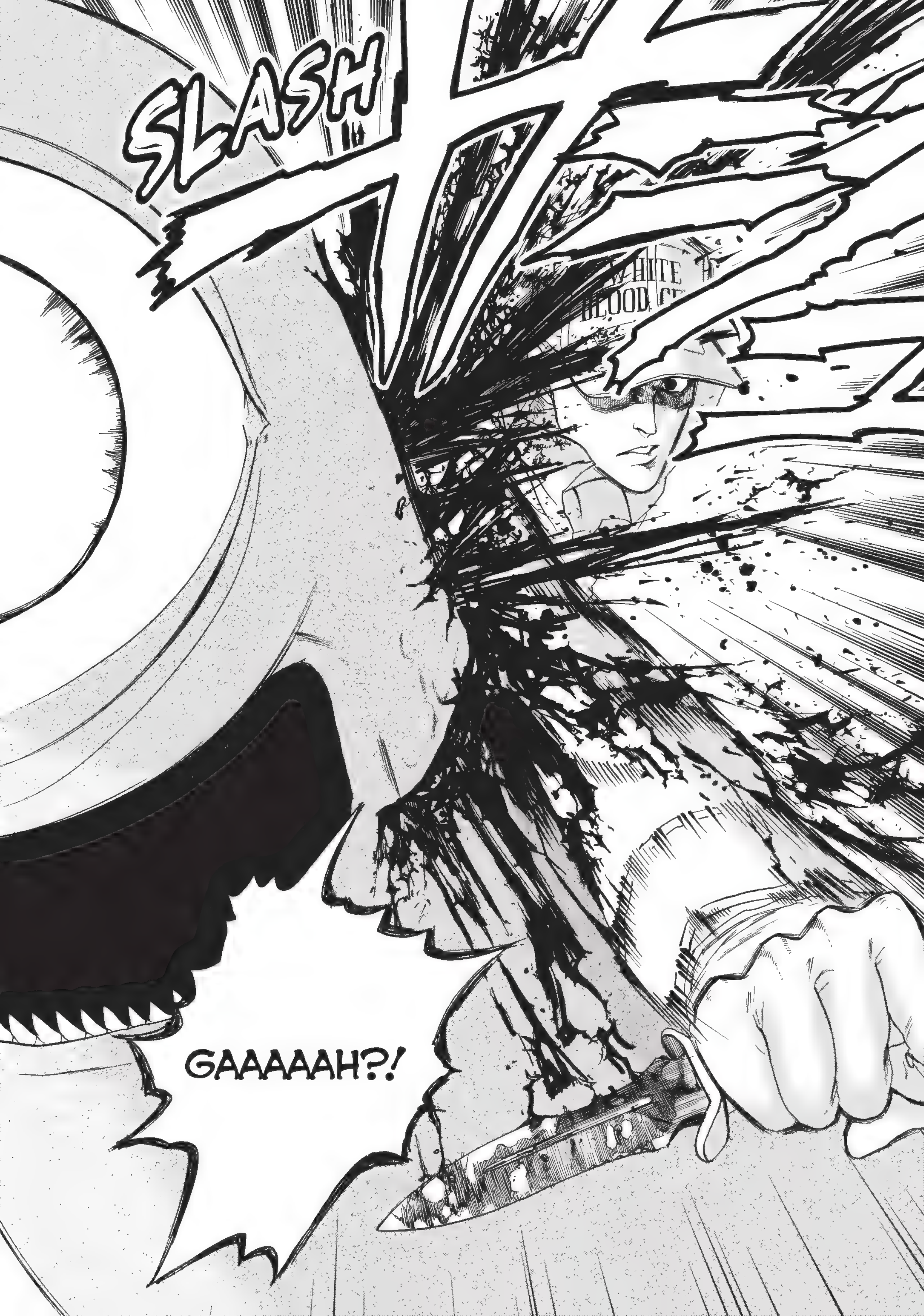

ANTIGEN SIGHTED!!!
POSE
ビシッ
...

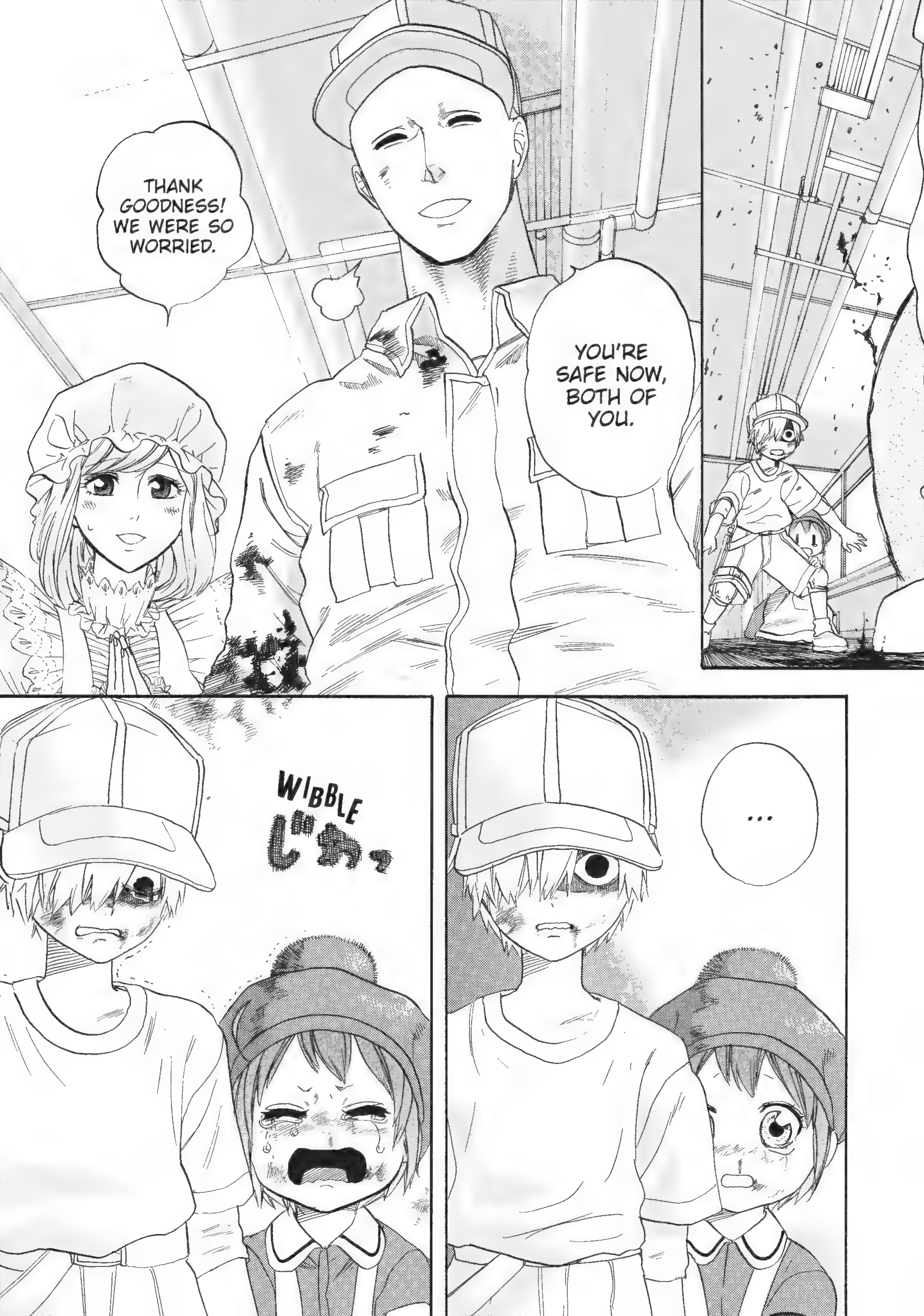
Myelocyte
A cell that has yet to differentiate into a white blood cell (neutrophil, eosinophil, or basophil). Lives in the bone marrow.

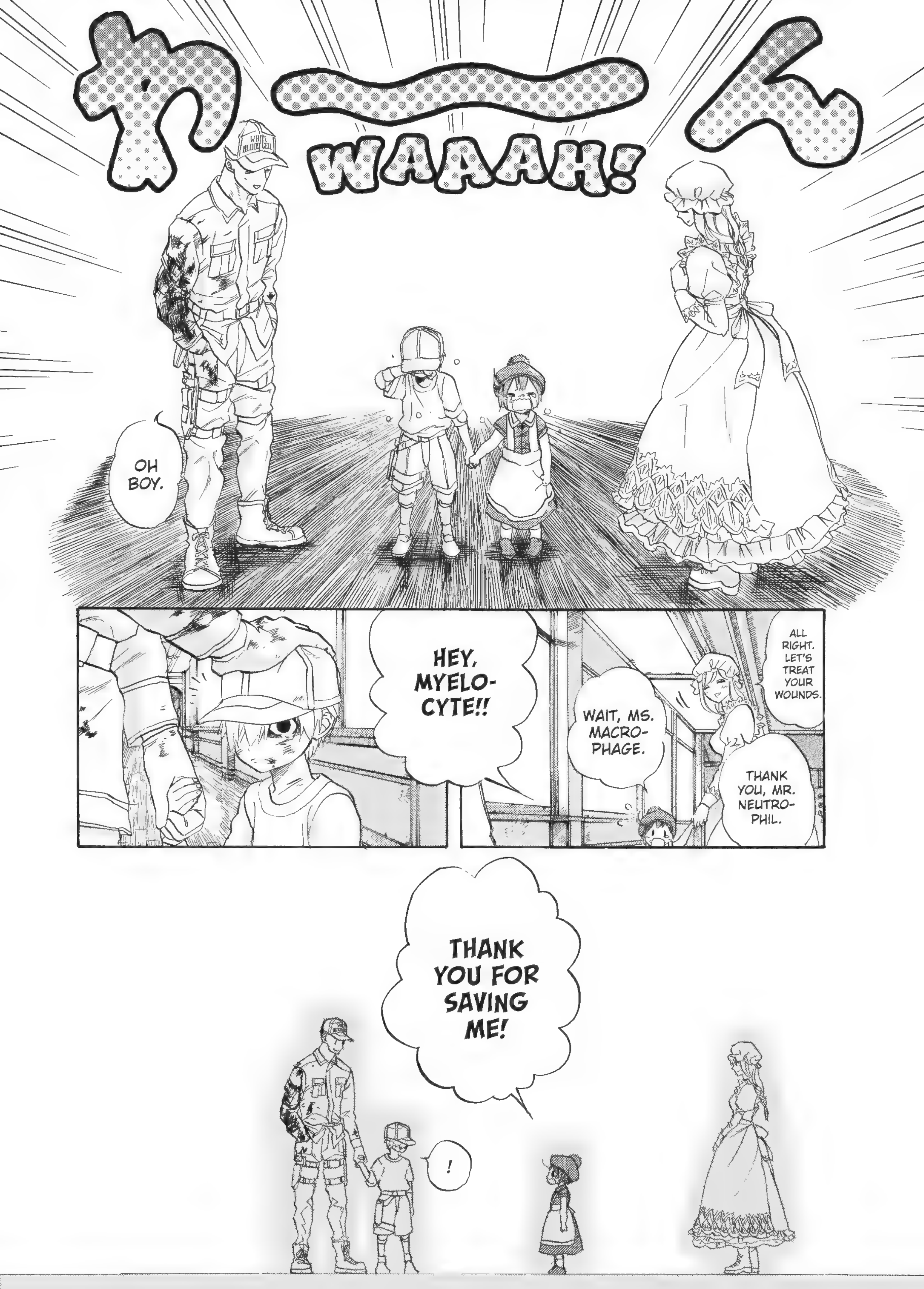

AND WHO ARE YOU?
A BACTERIUM DOESN'T DESERVE TO KNOW MY NAME.
POSE
HM, ARE YOU A MYELOCYTE? A BABY WHITE BLOOD CELL?
YOU MEAN TO KILL ME?
OH, I'M SO SCARED!
STAAND
THAT'S RIGHT! I'M GONNA BEAT YOU UP!!
TAKE THIS, GERM!
LUNGE
HEH!
SLAP
GAH?! MY WEAPON!!
AAAH!
G-GIVE IT BACK!
DO ALL THE BRATS IN THIS BODY HAVE AS MUCH ENERGY AS YOU TWO?
I'M SURE YOU'D GROW UP INTO GREAT BLOOD CELLS.

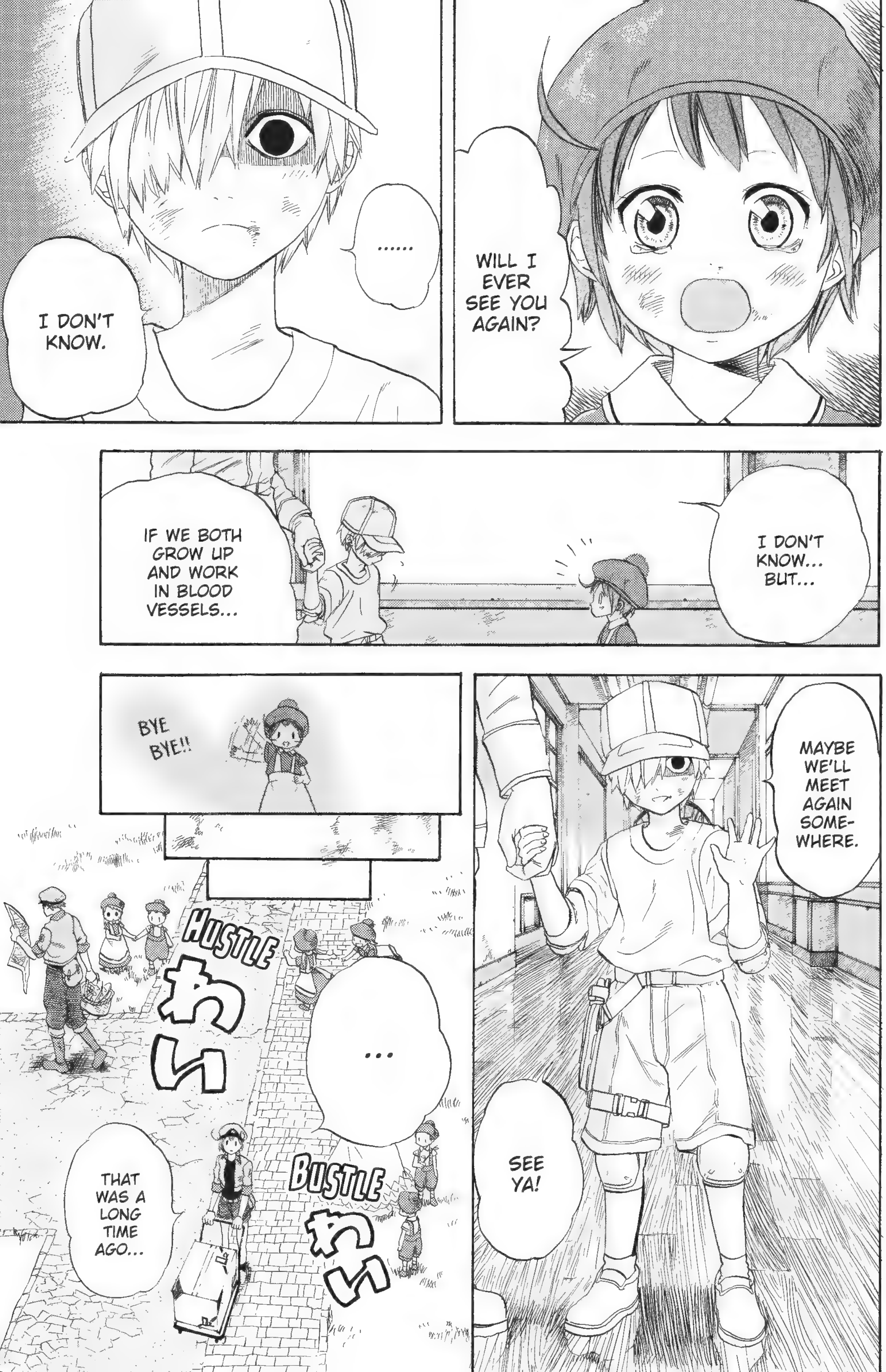

IF YOU WERE GONNA BE ALIVE THAT LONG, ANYWAY!!!
LUNGE
AAAAAAAAA!
HEH. PATHETIC.
GUH!
WHACK
OH NO! ARE YOU OKAY?!

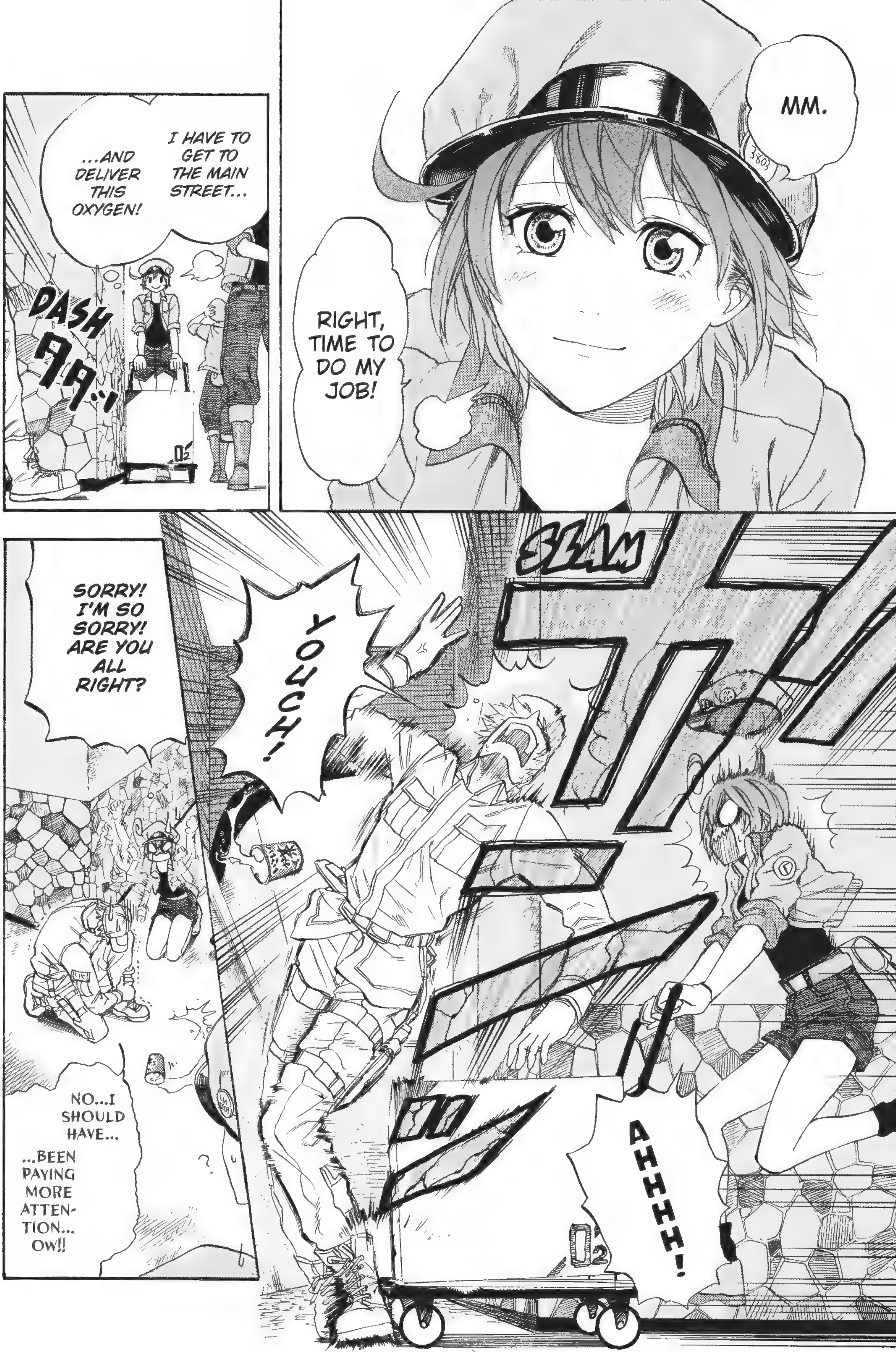

HA HA HA. SO MUCH FUN.
SHATTERING THE DREAMS OF LITTLE KIDS, BREAKING THEIR PRIDE!
SLAP
MAN, DO I LOVE BEING A BULLY.
SLAP
SLAP
AAAAAAH!
GUH...
SWAY
SWAY
NOOO, DON'T DIE!!
SO WHAT'LL IT BE, KID? I LIKE KIDS WITH SOME GUTS.
GRIN
GRIN
I'LL SPARE YOUR LIFE IF YOU HAND OVER THAT ERYTHROBLAST. WHAT D'YOU SAY?
THEN D—
SOB
GO TO HELL... I'D NEVER DO THAT...!
WHITE BLOOD CELLS PROTECT OTHER CELLS, EVEN IF IT COSTS THEM THEIR OWN LIVES. I'M GOING TO BE A GREAT WHITE BLOOD CELL SOMEDAY!!
STEP
THAT'S THE SPIRIT, YOUNG MYELOCYTE!

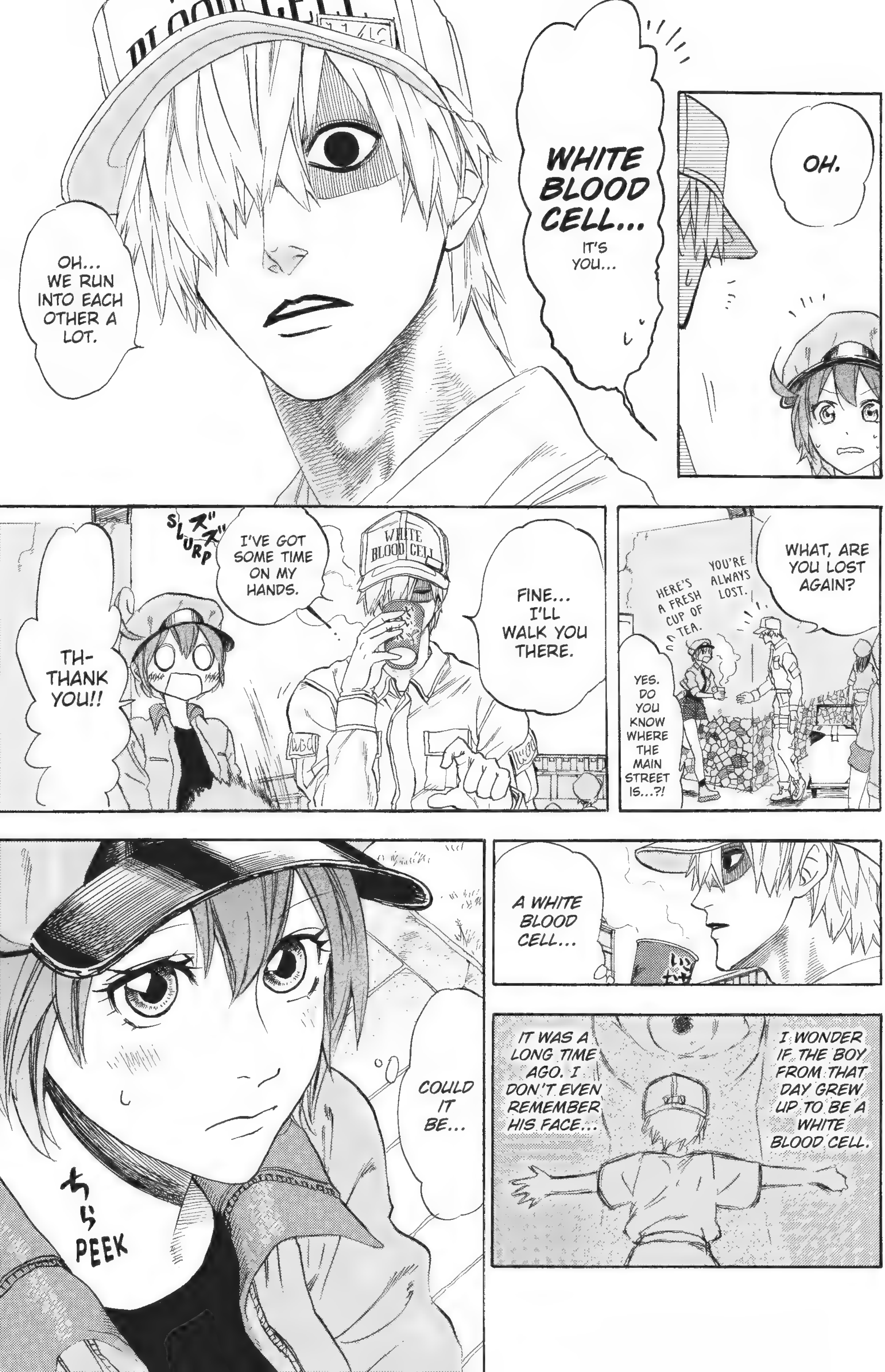

SLASH
WHITE
BLOOD
GAAAAAH?!

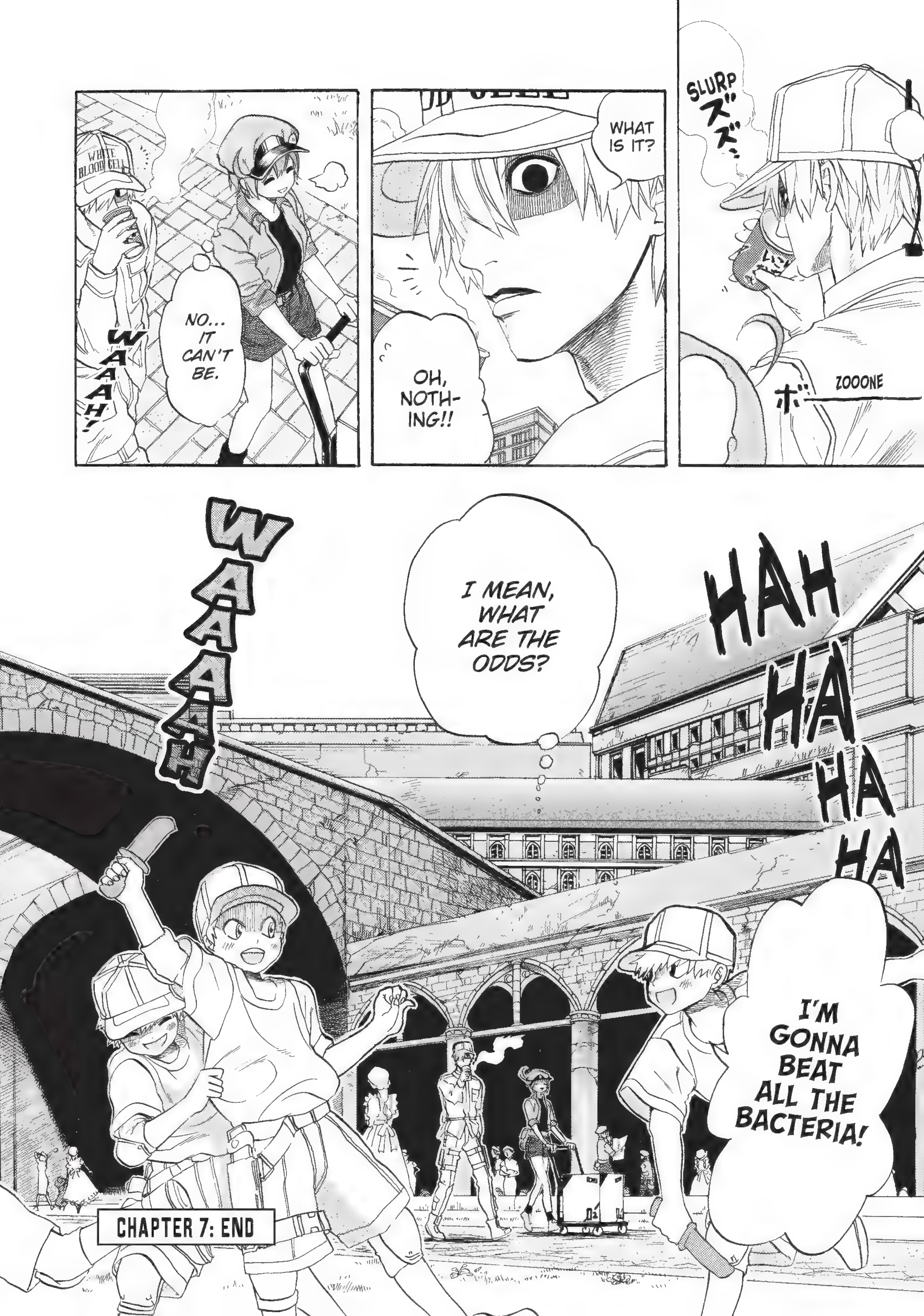

YOU'RE SAFE NOW, BOTH OF YOU.
THANK GOODNESS! WE WERE SO WORRIED.
...
WIBBLE
じわっ


わーーん
WAAAAH!
WHITE BLOOD CELL
OH BOY.
ALL RIGHT. LET'S TREAT YOUR WOUNDS.
THANK YOU, MR. NEUTROPHIL.
WAIT, MS. MACROPHAGE.
HEY, MYELOCYTE!!
THANK YOU FOR SAVING ME!
!

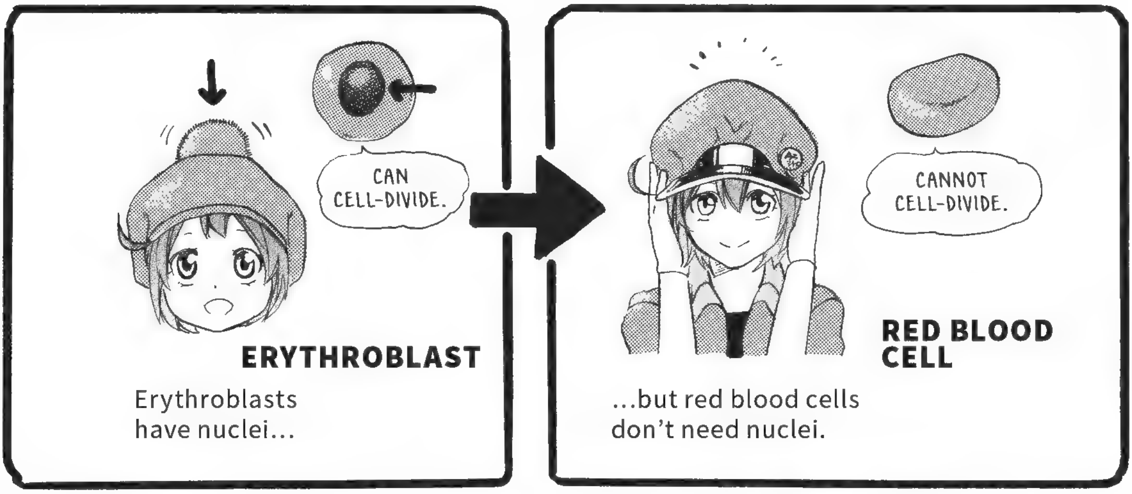

WILL I EVER SEE YOU AGAIN?
......
I DON'T KNOW.
I DON'T KNOW... BUT...
IF WE BOTH GROW UP AND WORK IN BLOOD VESSELS...
MAYBE WE'LL MEET AGAIN SOMEWHERE.
SEE YA!
BYE BYE!!
HUSTLE わい
...
BUSTLE わい
THAT WAS A LONG TIME AGO...


3803
MM.
RIGHT, TIME TO DO MY JOB!
I HAVE TO GET TO THE MAIN STREET...
...AND DELIVER THIS OXYGEN!
DASH
ダッ
O2
SLAM
YOUCH!
AHHHH!
O2
SORRY! I'M SO SORRY! ARE YOU ALL RIGHT?
NO...I SHOULD HAVE...
...BEEN PAYING MORE ATTENTION... OW!!


OH.
WHITE BLOOD CELL... IT'S YOU...
OH... WE RUN INTO EACH OTHER A LOT.
WHAT, ARE YOU LOST AGAIN?
YOU'RE ALWAYS LOST.
HERE'S A FRESH CUP OF TEA.
YES. DO YOU KNOW WHERE THE MAIN STREET IS...?!
FINE... I'LL WALK YOU THERE.
WHITE BLOOD CELL
I'VE GOT SOME TIME ON MY HANDS.
SLURP
TH-THANK YOU!!
A WHITE BLOOD CELL...
I WONDER IF THE BOY FROM THAT DAY GREW UP TO BE A WHITE BLOOD CELL.
IT WAS A LONG TIME AGO. I DON'T EVEN REMEMBER HIS FACE...
COULD IT BE...
ちら
PEEK

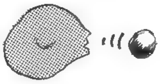

SLURP ズズ…
ボ
ZOOONE
WHAT IS IT?
OH, NOTHING!!
NO… IT CAN'T BE.
WAAAAH!
HAH HA HA HA HA
I'M GONNA BEAT ALL THE BACTERIA!
I MEAN, WHAT ARE THE ODDS?
WAAAAAAH
CHAPTER 7: END

ENUCLEATION OF ERYTHROBLASTS


CAN CELL-DIVIDE.
ERYTHROBLAST
CANNOT CELL-DIVIDE.
RED BLOOD CELL

Erythroblasts have nuclei…

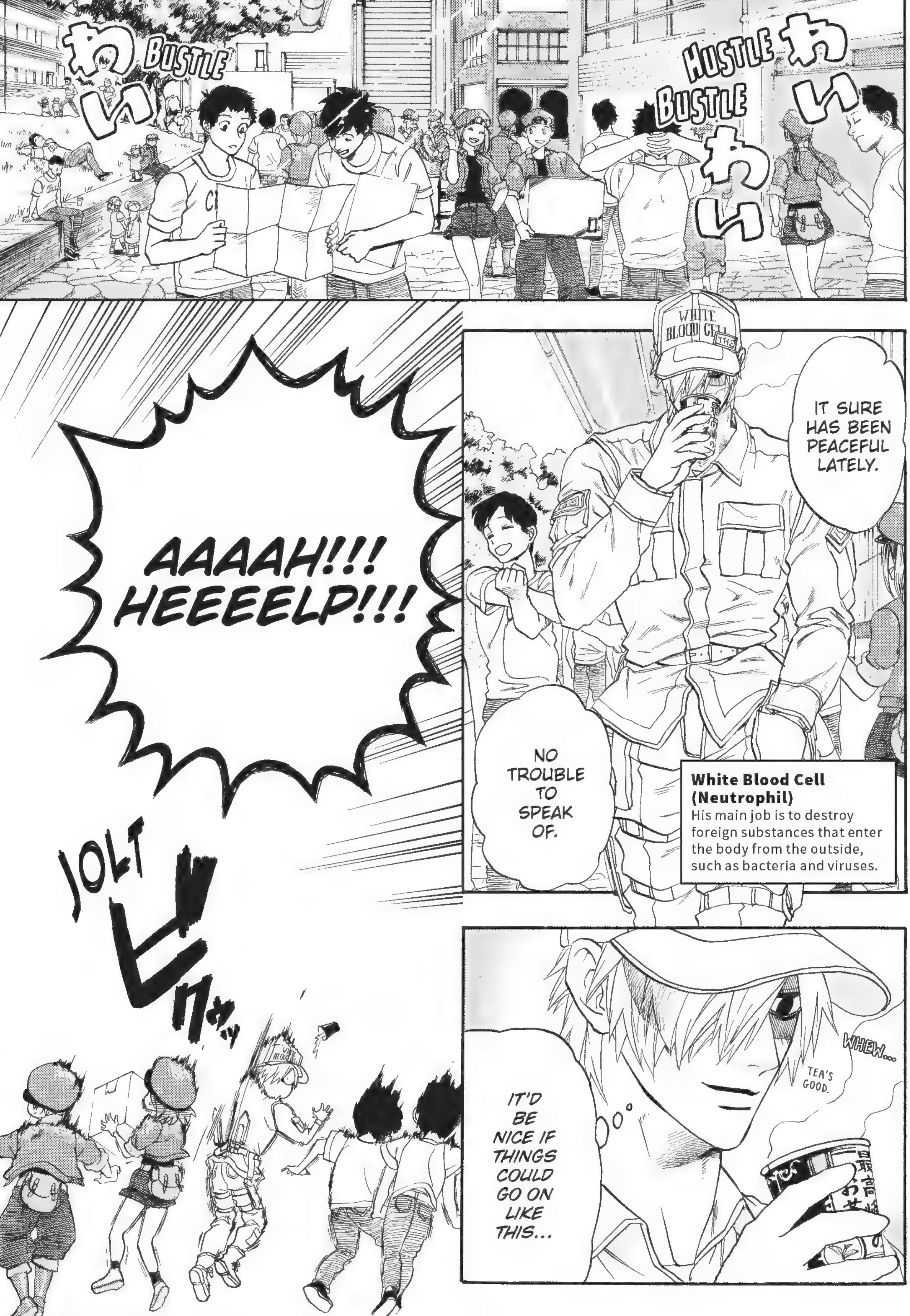
…but red blood cells don't need nuclei.



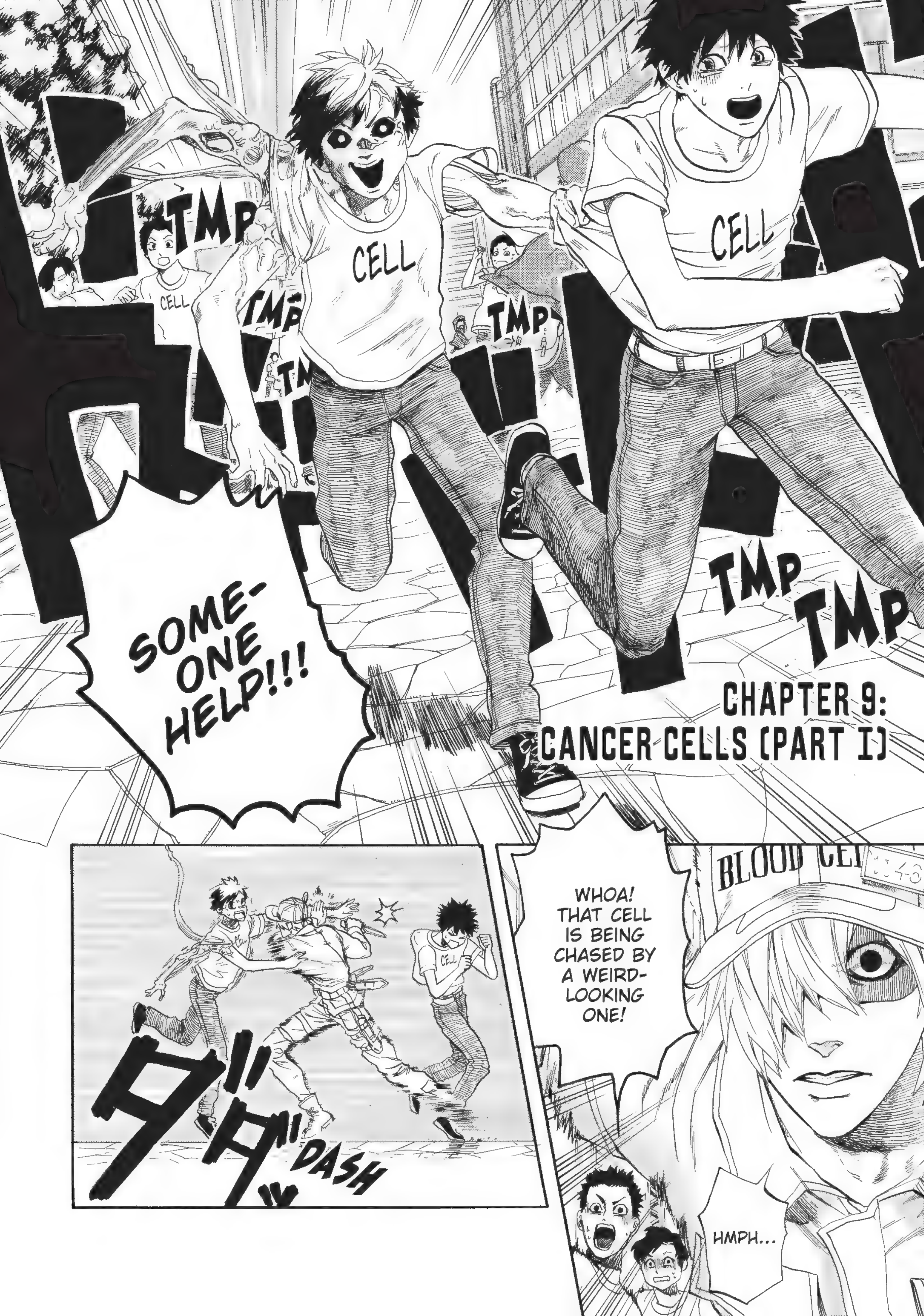
This is called **enucleation.**

This is a mark of becoming a full-fledged red blood cell.

Cells at Work!
はたらく細胞

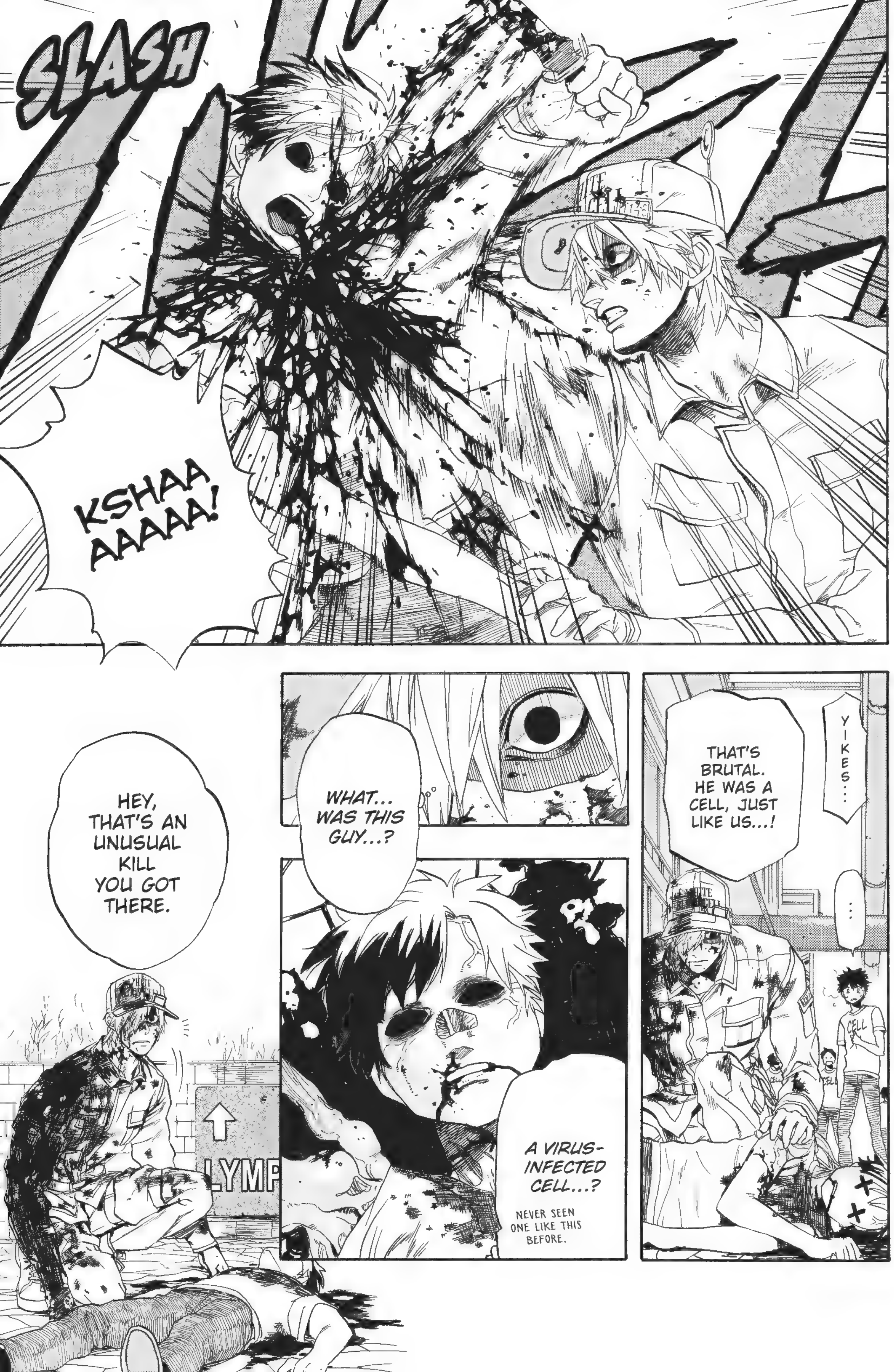

わい
HUSTLE
BUSTLE
わい
わい
BUSTLE
WHITE BLOOD CELL
IT SURE HAS BEEN PEACEFUL LATELY.
NO TROUBLE TO SPEAK OF.
WHEW...
TEA'S GOOD.
IT'D BE NICE IF THINGS COULD GO ON LIKE THIS...
AAAAH!!! HEEEEELP!!!
JOLT
ビクッ

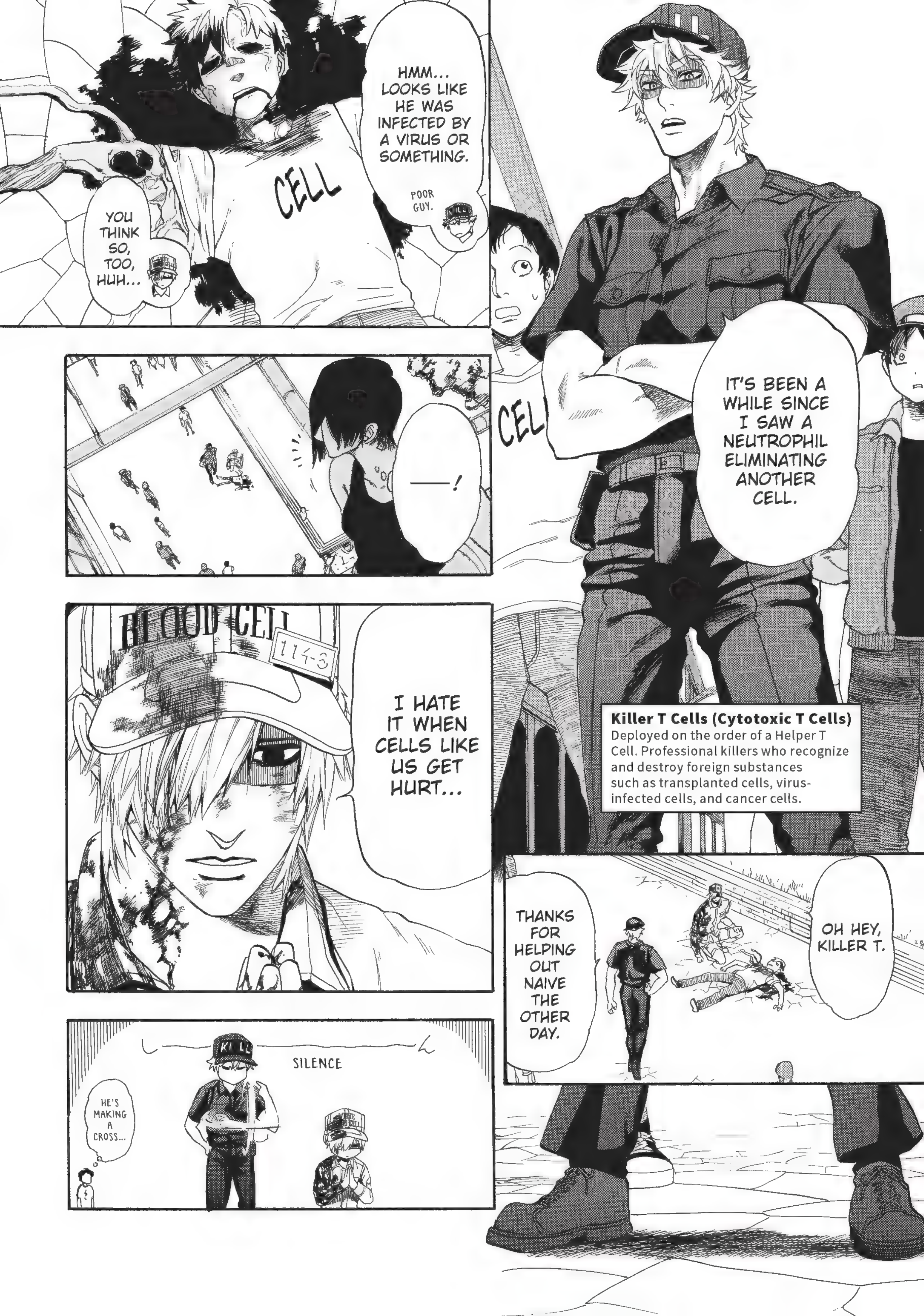
White Blood Cell (Neutrophil)
His main job is to destroy foreign substances that enter the body from the outside, such as bacteria and viruses.



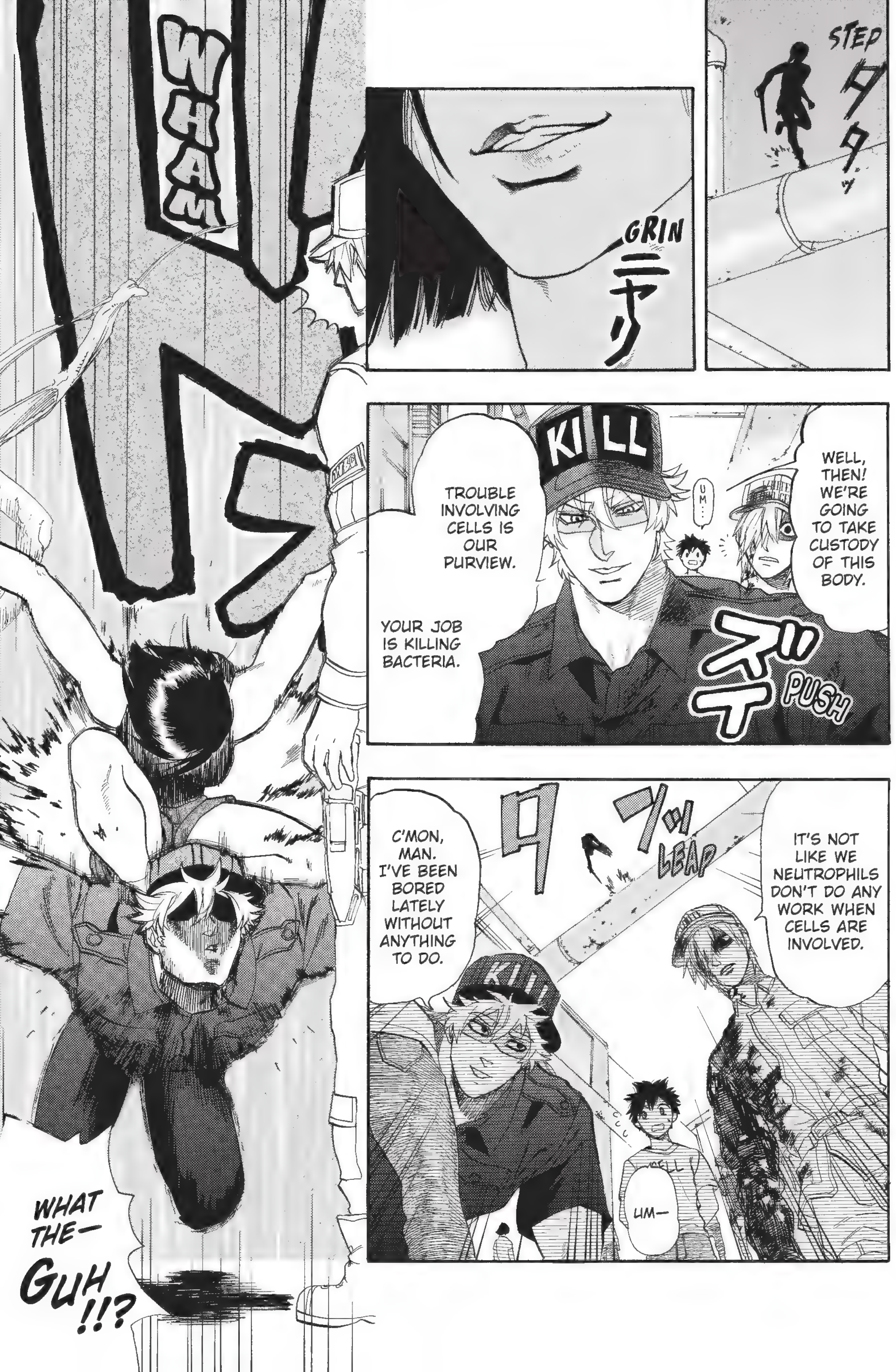
CHAPTER 9: CANCER CELLS (PART I)

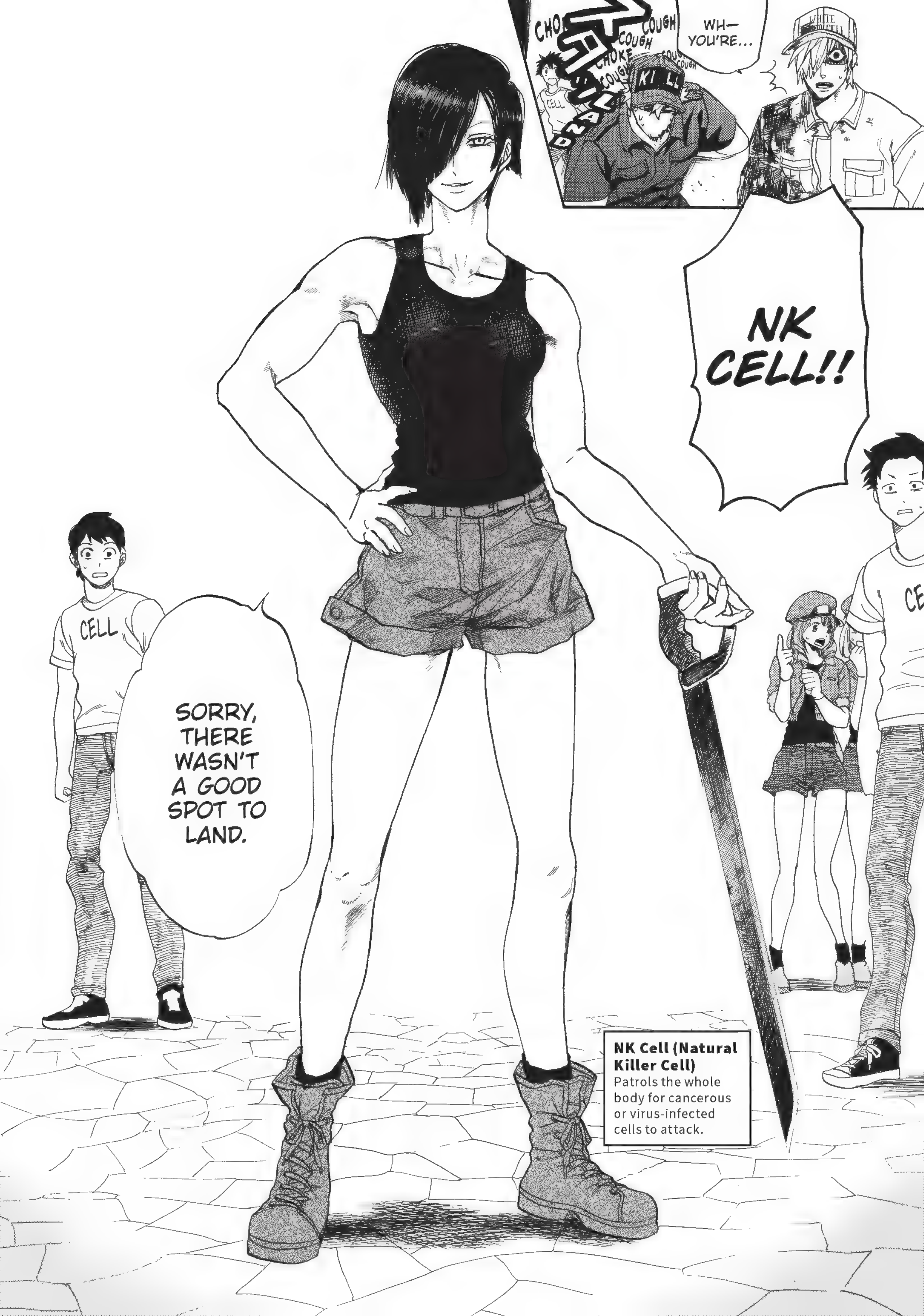
CELL
CELL
CELL
TMP
TMP
TMP
TMP
TMP
TMP
SOME-ONE HELP!!!
BLOOD CEL
WHOA! THAT CELL IS BEING CHASED BY A WEIRD-LOOKING ONE!
HMPH...
CELL
ダダッ
DASH


SLASH
KSHAA AAAAA!
YIKES...
THAT'S BRUTAL. HE WAS A CELL, JUST LIKE US...!
...
WHAT... WAS THIS GUY...?
A VIRUS-INFECTED CELL...?
NEVER SEEN ONE LIKE THIS BEFORE.
HEY, THAT'S AN UNUSUAL KILL YOU GOT THERE.
CELL
LYMP

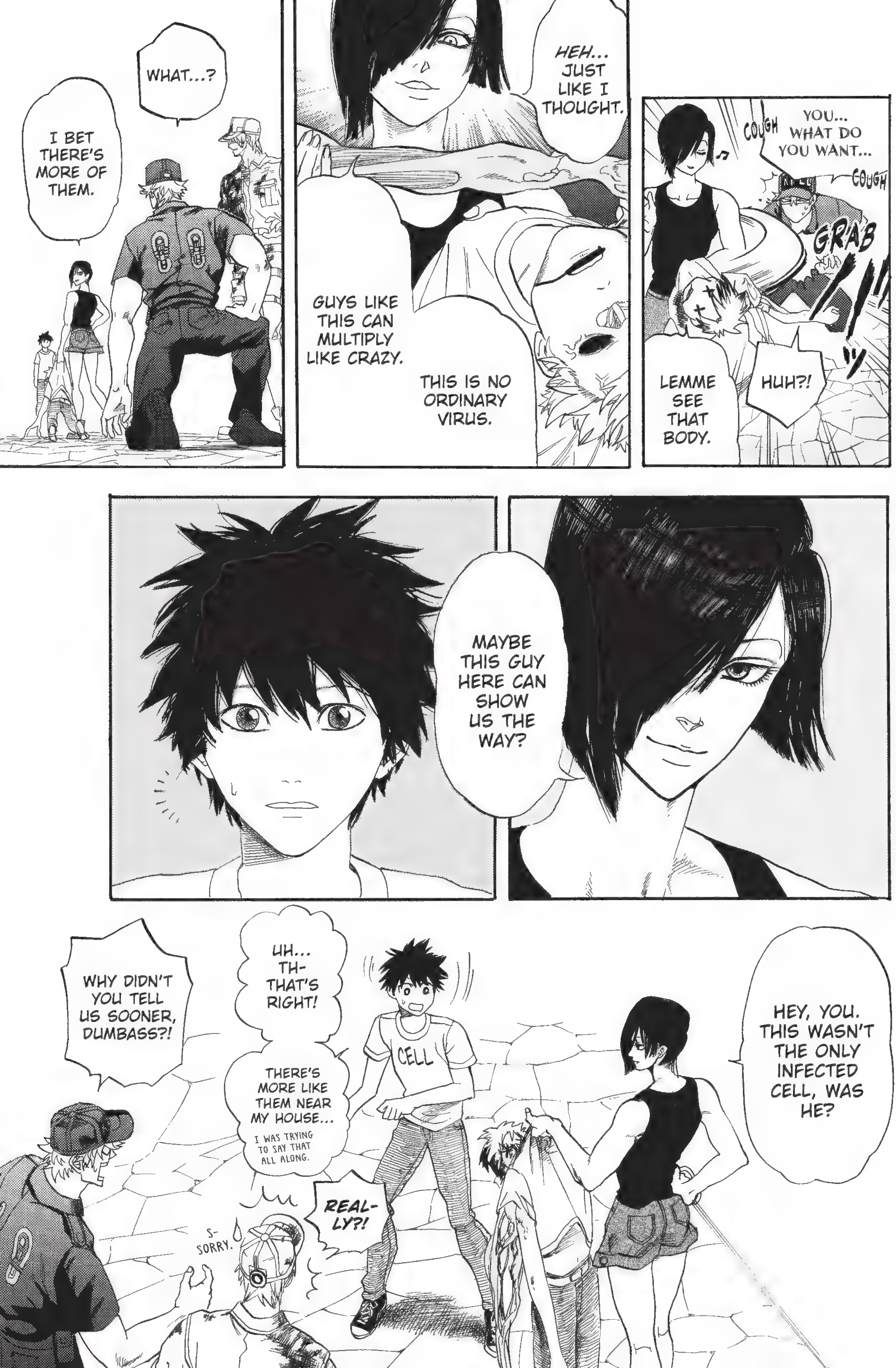

IT'S BEEN A WHILE SINCE I SAW A NEUTROPHIL ELIMINATING ANOTHER CELL.
CELL
HMM... LOOKS LIKE HE WAS INFECTED BY A VIRUS OR SOMETHING.
POOR GUY.
YOU THINK SO, TOO, HUH...
—!
BLOOD CELL 1146
I HATE IT WHEN CELLS LIKE US GET HURT...
OH HEY, KILLER T.
THANKS FOR HELPING OUT NAIVE THE OTHER DAY.
SILENCE
HE'S MAKING A CROSS...

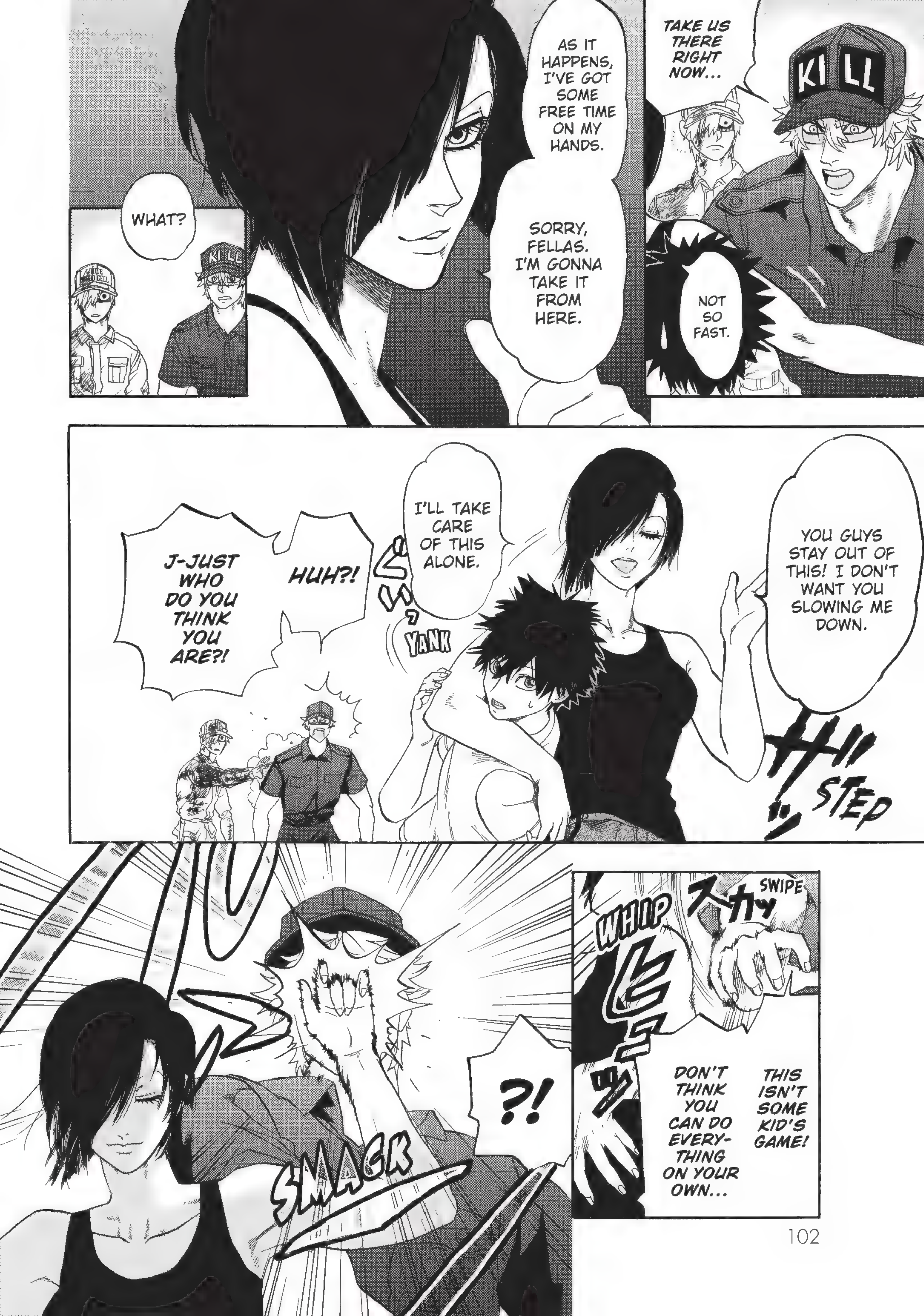
Killer T Cells (Cytotoxic T Cells)
Deployed on the order of a Helper T Cell. Professional killers who recognize and destroy foreign substances such as transplanted cells, virus-infected cells, and cancer cells.

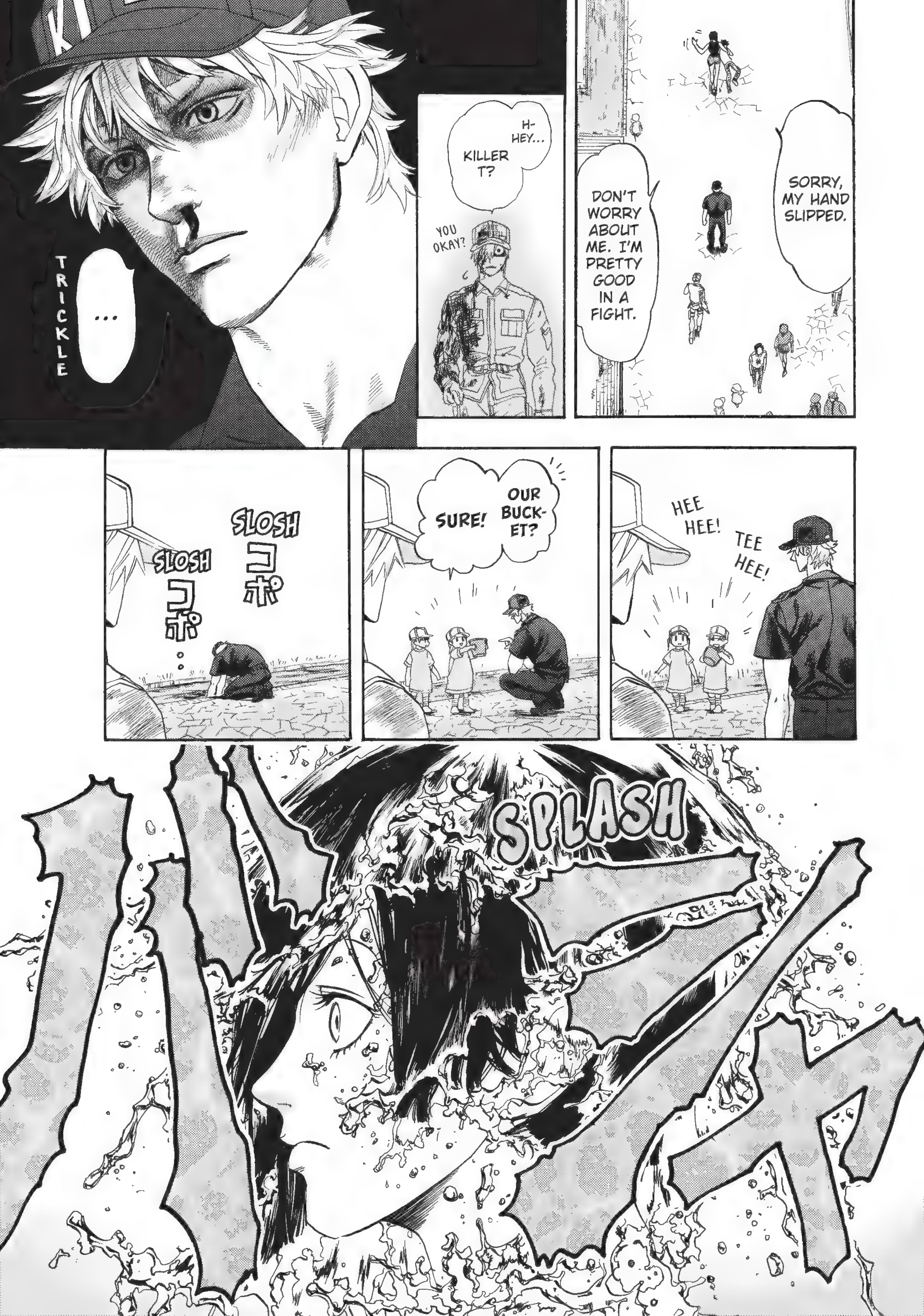

STEP
タタッ
GRIN
ニヤリ
WELL, THEN! WE'RE GOING TO TAKE CUSTODY OF THIS BODY.
UM...
TROUBLE INVOLVING CELLS IS OUR PURVIEW.
YOUR JOB IS KILLING BACTERIA.
ズイ
PUSH
IT'S NOT LIKE WE NEUTROPHILS DON'T DO ANY WORK WHEN CELLS ARE INVOLVED.
タッ
LEAP
C'MON, MAN. I'VE BEEN BORED LATELY WITHOUT ANYTHING TO DO.
UM—
WHAM
WHAT THE—
GUH!!?

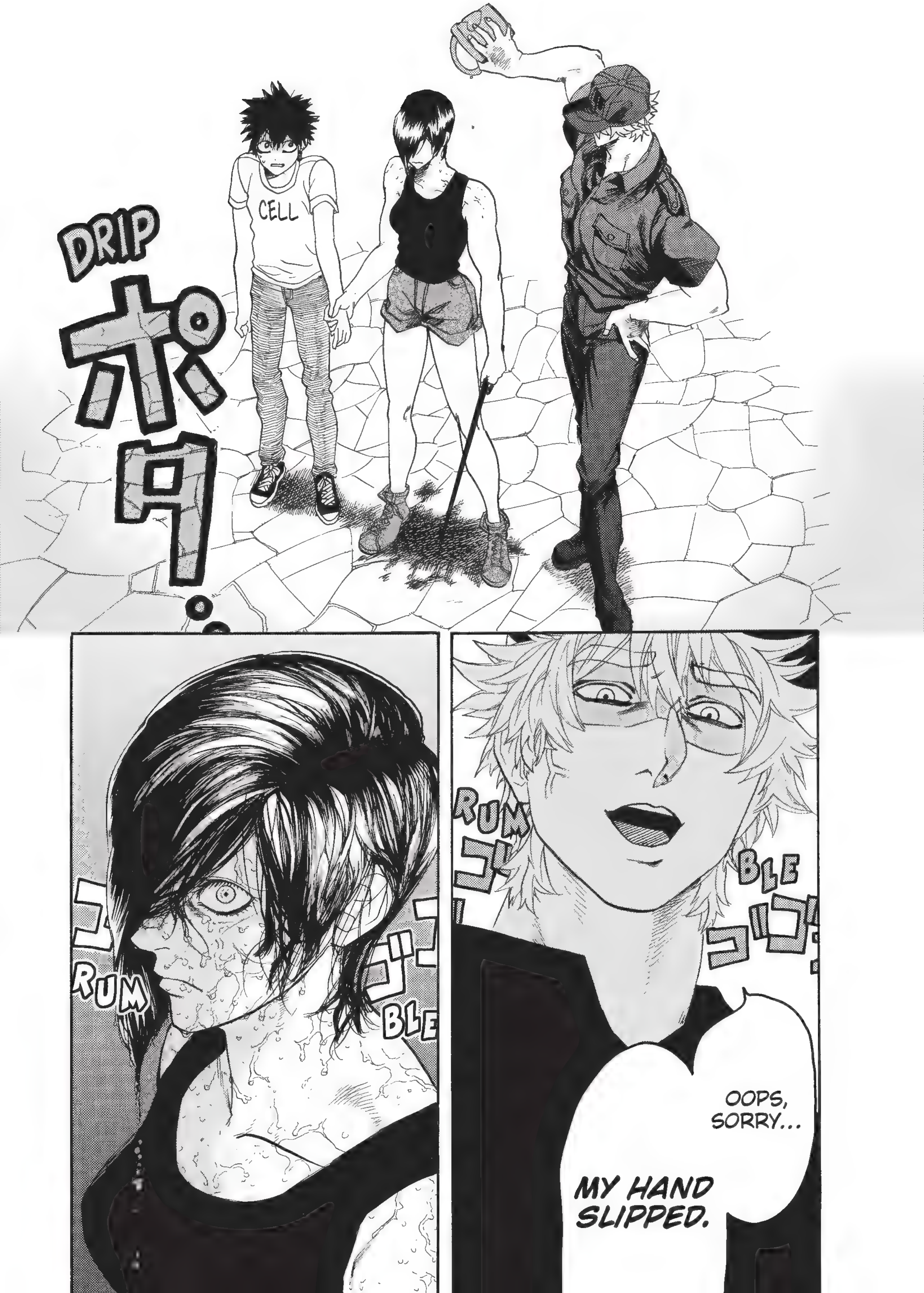

WH— YOU'RE...
CHOKE COUGH COUGH CHOKE COUGH COUGH COUGH
WHITE
KILL
CELL
NK CELL!!
SORRY, THERE WASN'T A GOOD SPOT TO LAND.
CELL
CELL

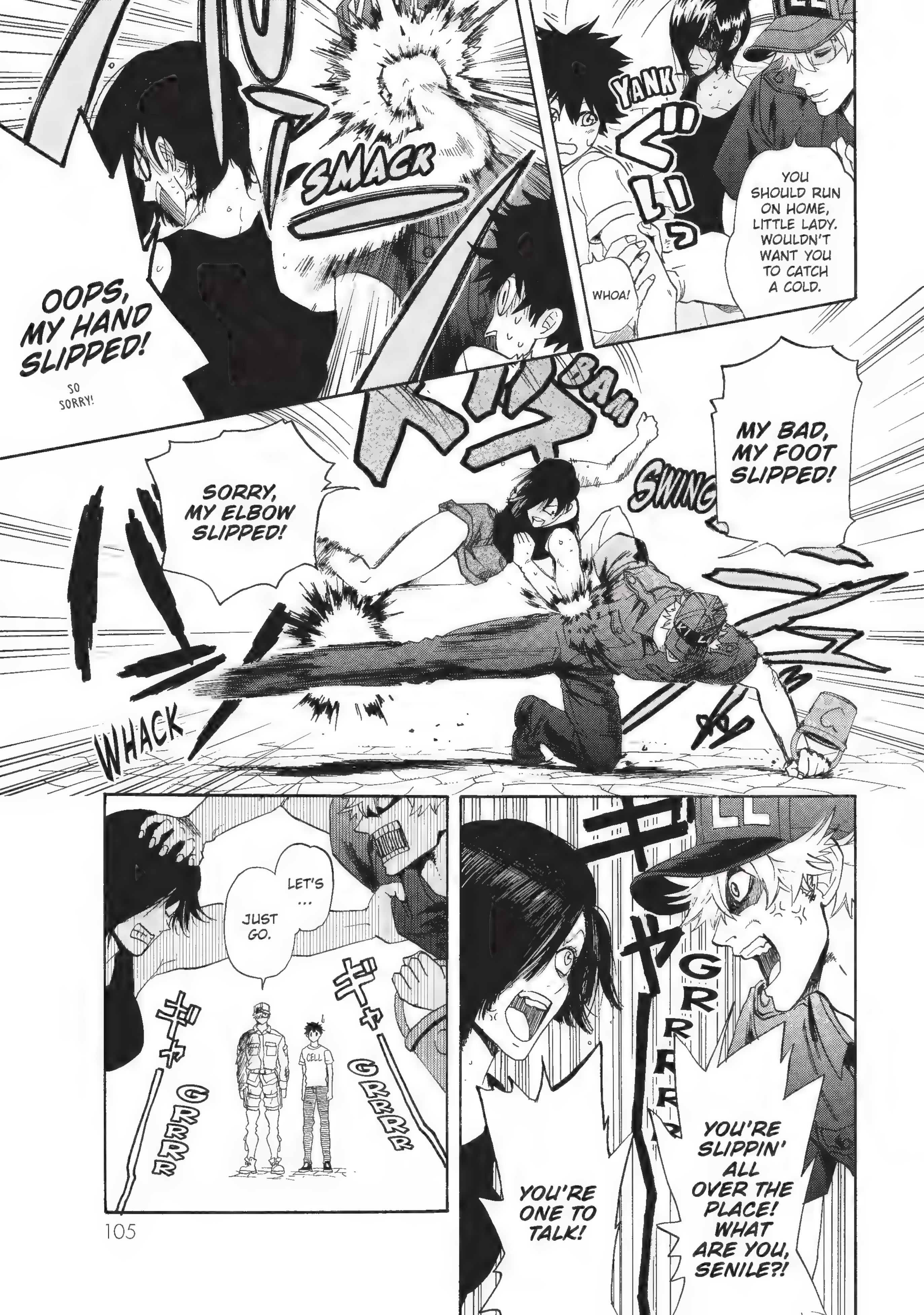
NK Cell (Natural Killer Cell)
Patrols the whole body for cancerous or virus-infected cells to attack.

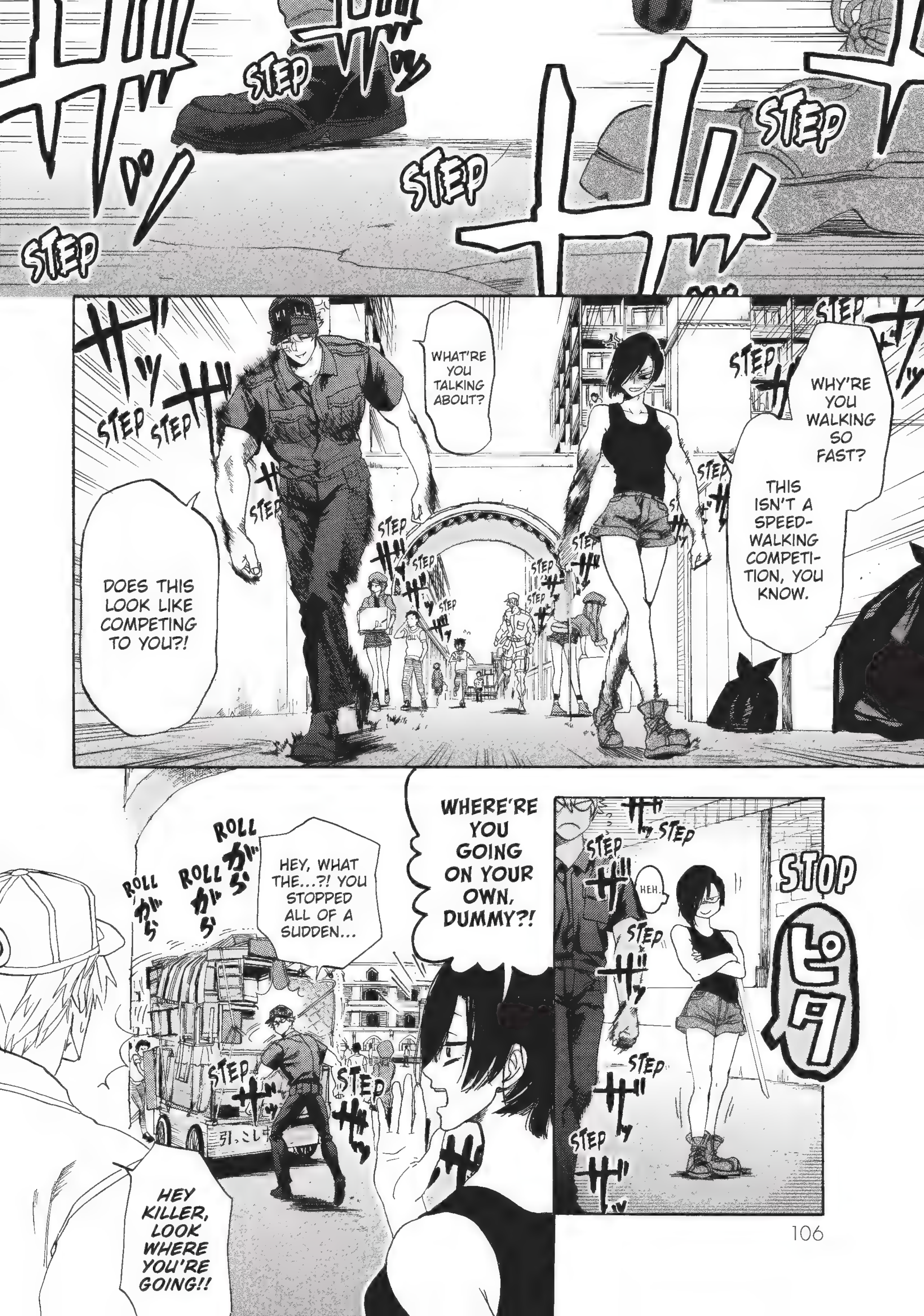

YOU... WHAT DO YOU WANT...
COUGH
COUGH
GRAB
LEMME SEE THAT BODY.
HUH?!
HEH... JUST LIKE I THOUGHT.
GUYS LIKE THIS CAN MULTIPLY LIKE CRAZY.
THIS IS NO ORDINARY VIRUS.
WHAT...?
I BET THERE'S MORE OF THEM.
MAYBE THIS GUY HERE CAN SHOW US THE WAY?
HEY, YOU. THIS WASN'T THE ONLY INFECTED CELL, WAS HE?
UH... TH-THAT'S RIGHT!
THERE'S MORE LIKE THEM NEAR MY HOUSE... I WAS TRYING TO SAY THAT ALL ALONG.
CELL
WHY DIDN'T YOU TELL US SOONER, DUMBASS?!
REAL-LY?!
S-SORRY.

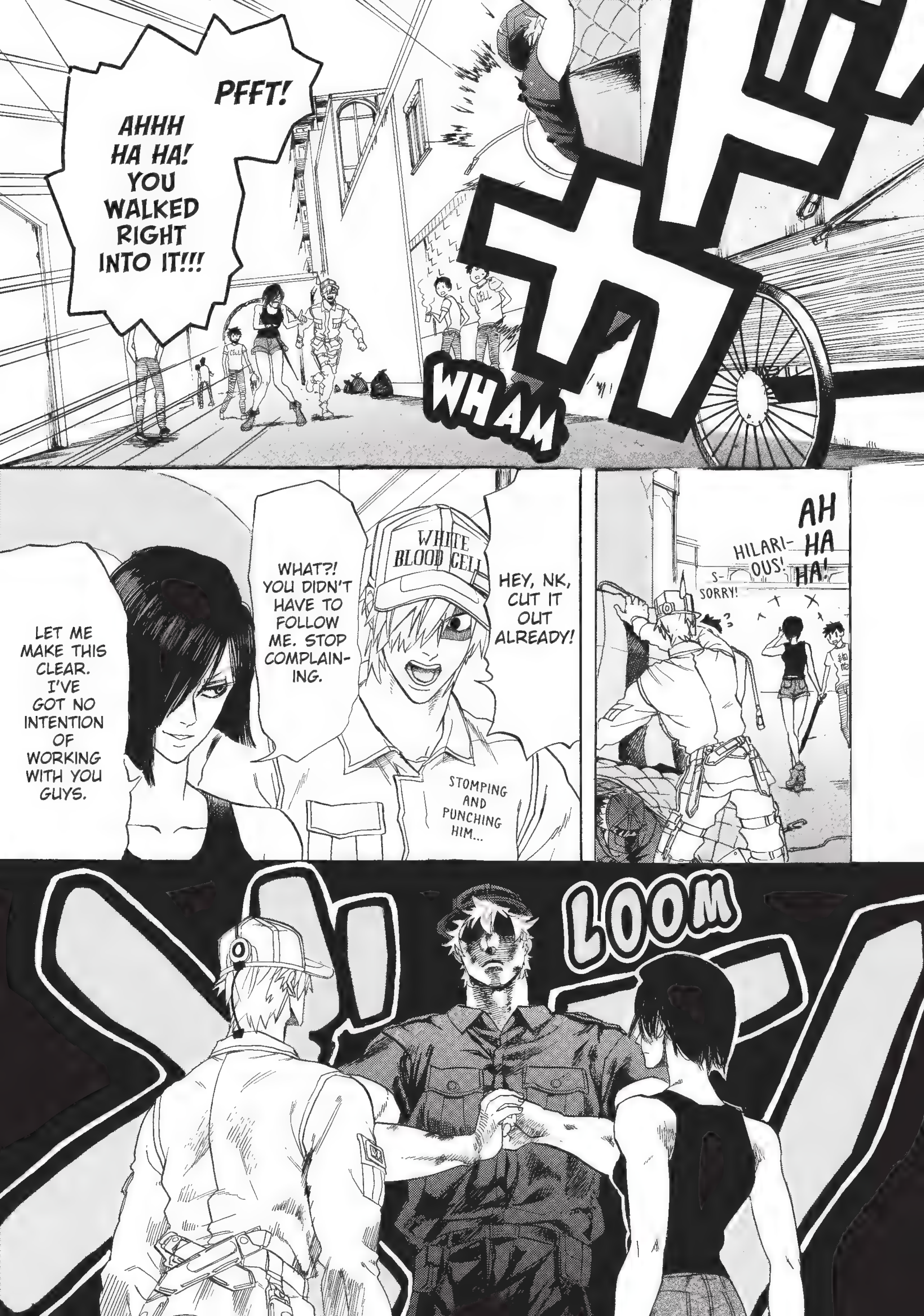

TAKE US THERE RIGHT NOW...
KILL
NOT SO FAST.
AS IT HAPPENS, I'VE GOT SOME FREE TIME ON MY HANDS.
SORRY, FELLAS. I'M GONNA TAKE IT FROM HERE.
WHAT?
STEP
YOU GUYS STAY OUT OF THIS! I DON'T WANT YOU SLOWING ME DOWN.
I'LL TAKE CARE OF THIS ALONE.
YANK
HUH?!
J-JUST WHO DO YOU THINK YOU ARE?!
SWIPE
WHIP
THIS ISN'T SOME KID'S GAME!
DON'T THINK YOU CAN DO EVERYTHING ON YOUR OWN...
?!
SMACK

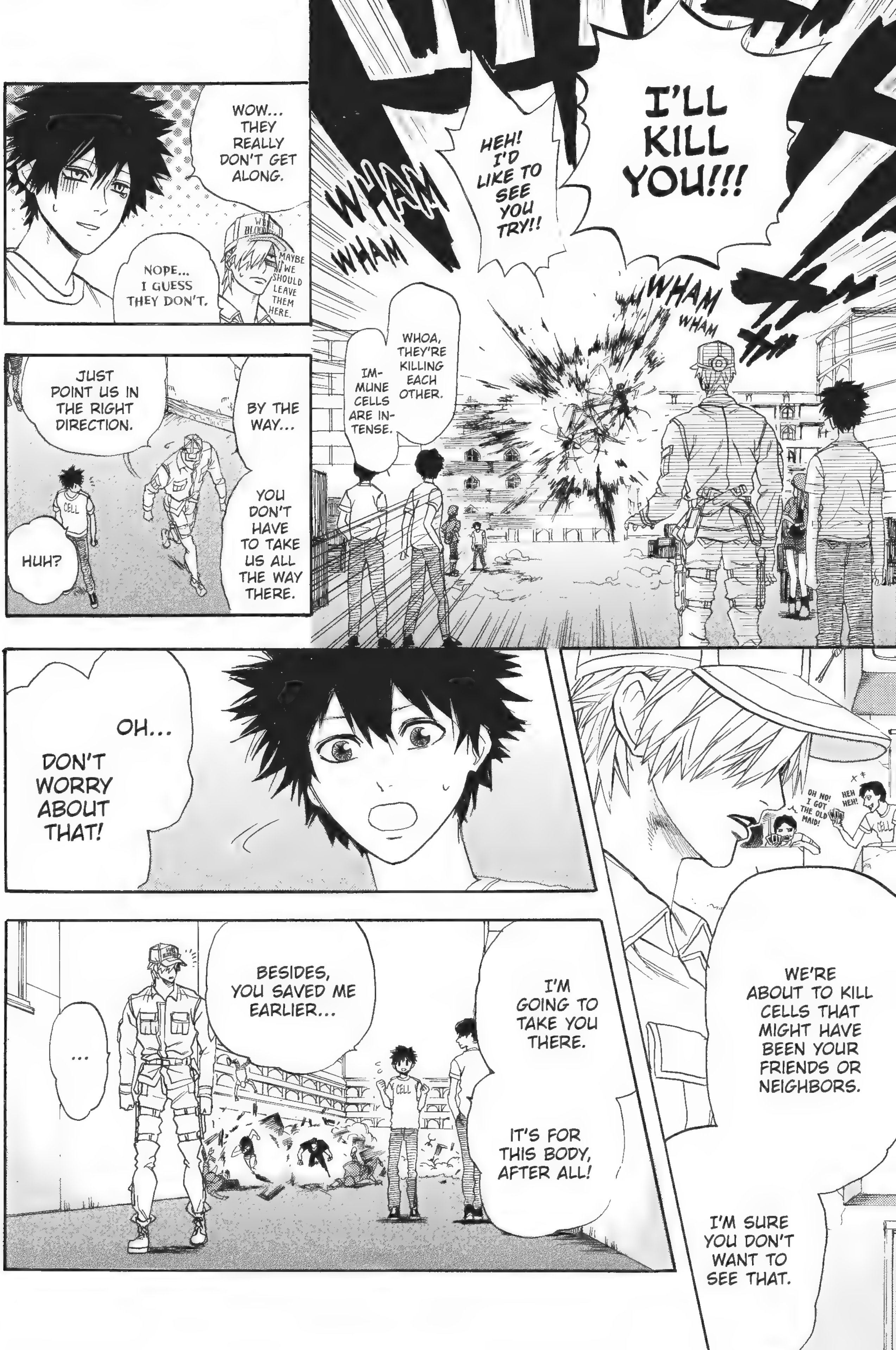

SORRY, MY HAND SLIPPED.
DON'T WORRY ABOUT ME. I'M PRETTY GOOD IN A FIGHT.
H-HEY... KILLER T?
YOU OKAY?
...
TRICKLE
HEE HEE!
TEE HEE!
OUR BUCKET?
SURE!
SLOSH コポ
SLOSH コポ
SPLASH

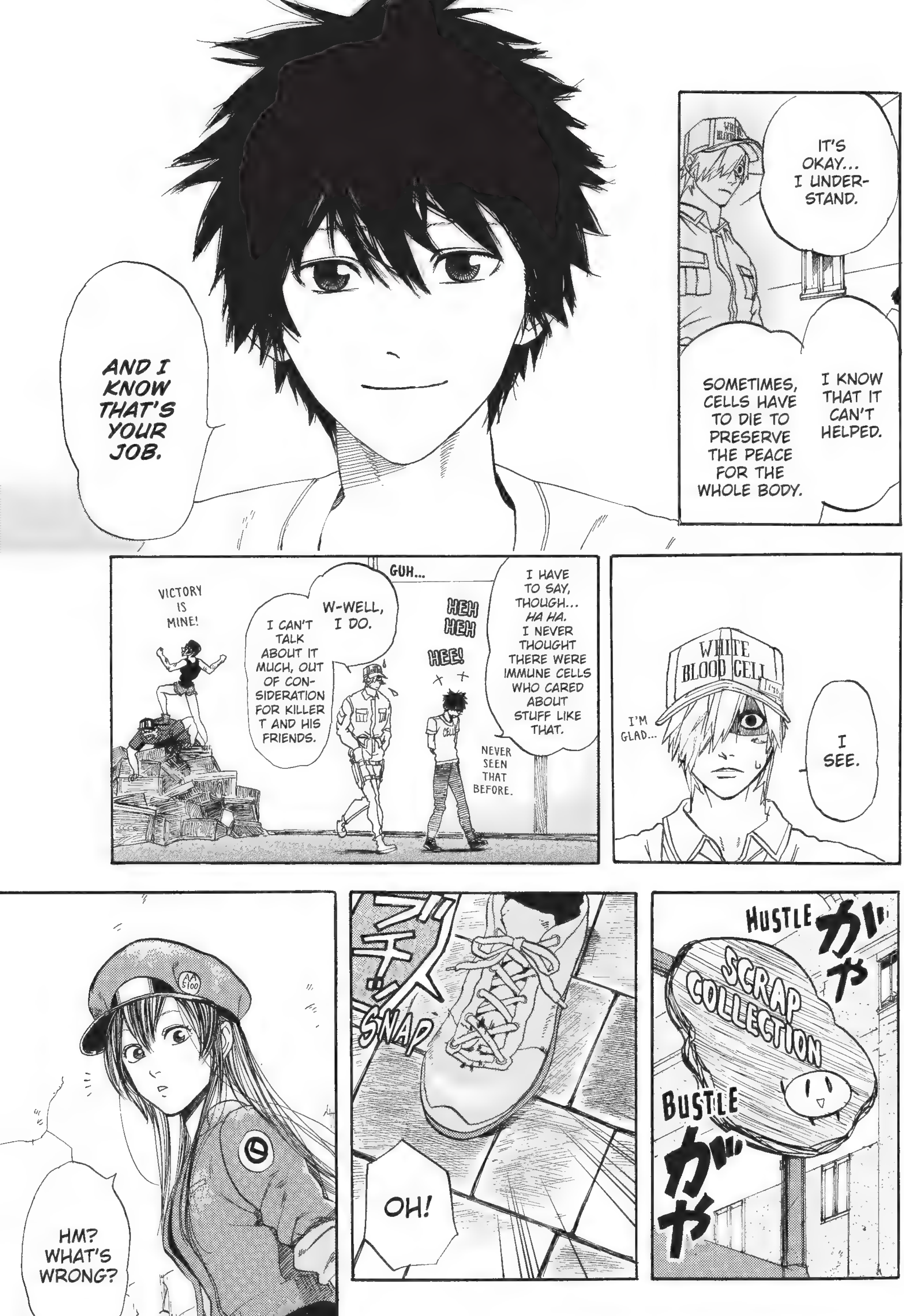

CELL
DRIP
ポタ…
RUMBLE
ゴゴゴ
OOPS, SORRY… MY HAND SLIPPED.
RUMBLE
ゴゴ

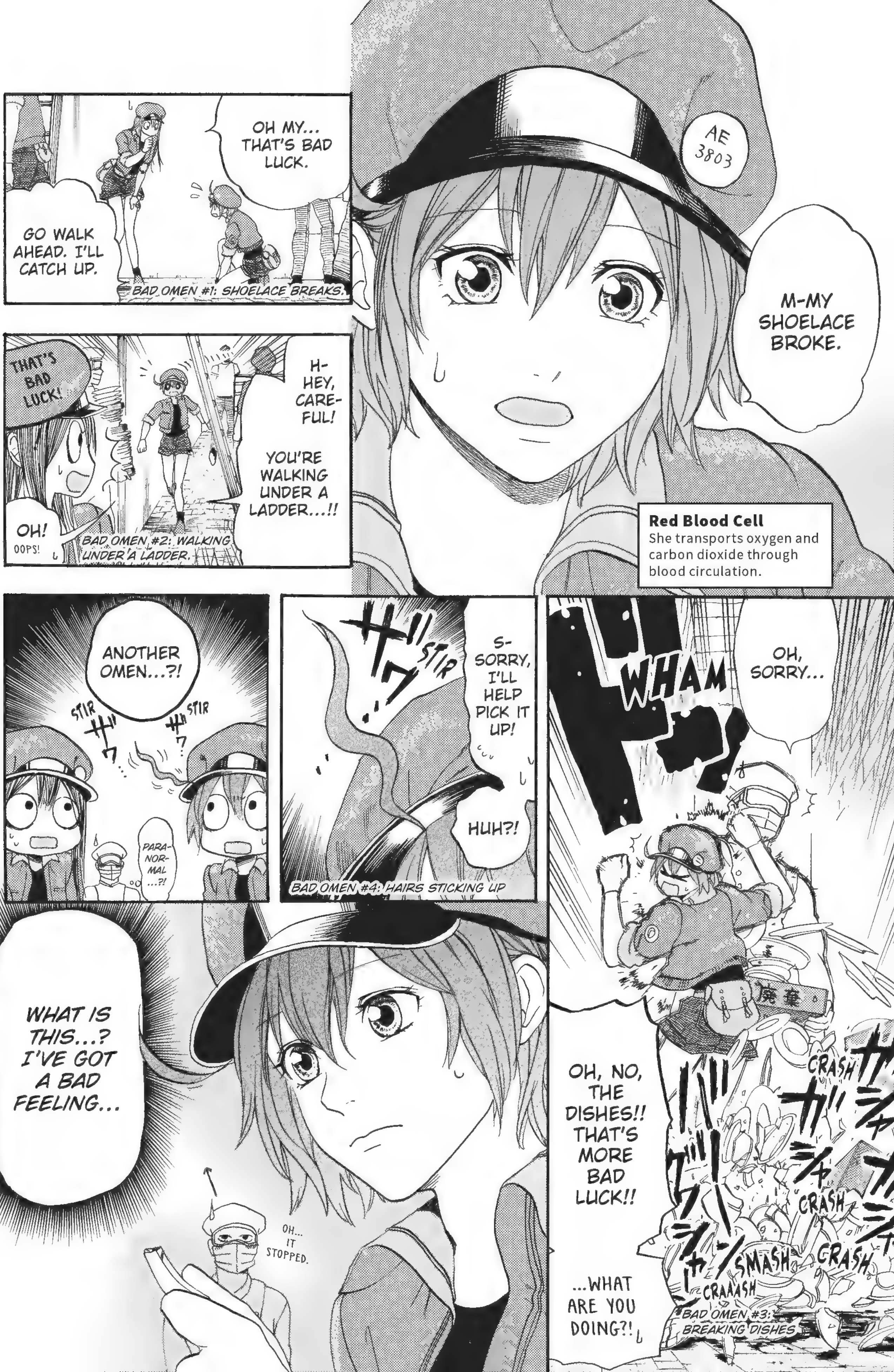

YANK
ぐいっ
YOU SHOULD RUN ON HOME, LITTLE LADY. WOULDN'T WANT YOU TO CATCH A COLD.
WHOA!
SMACK
OOPS, MY HAND SLIPPED!
SO SORRY!
MY BAD, MY FOOT SLIPPED!
SWING
BAM
SORRY, MY ELBOW SLIPPED!
WHACK
ギャ
GRRRRR
YOU'RE SLIPPIN' ALL OVER THE PLACE! WHAT ARE YOU, SENILE?!
YOU'RE ONE TO TALK!
ギャ
GRRRRR
LET'S ... JUST GO.
CELL
ギャ
GRRRRR


STEP
STEP
STEP
STEP
WHY'RE YOU WALKING SO FAST?
THIS ISN'T A SPEED-WALKING COMPETITION, YOU KNOW.
WHAT'RE YOU TALKING ABOUT?
DOES THIS LOOK LIKE COMPETING TO YOU?!
STEP
STEP
STOP
ピタ
HEH.
WHERE'RE YOU GOING ON YOUR OWN, DUMMY?!
HEY, WHAT THE...?! YOU STOPPED ALL OF A SUDDEN...
ROLL
ROLL
ROLL
HEY KILLER, LOOK WHERE YOU'RE GOING!!

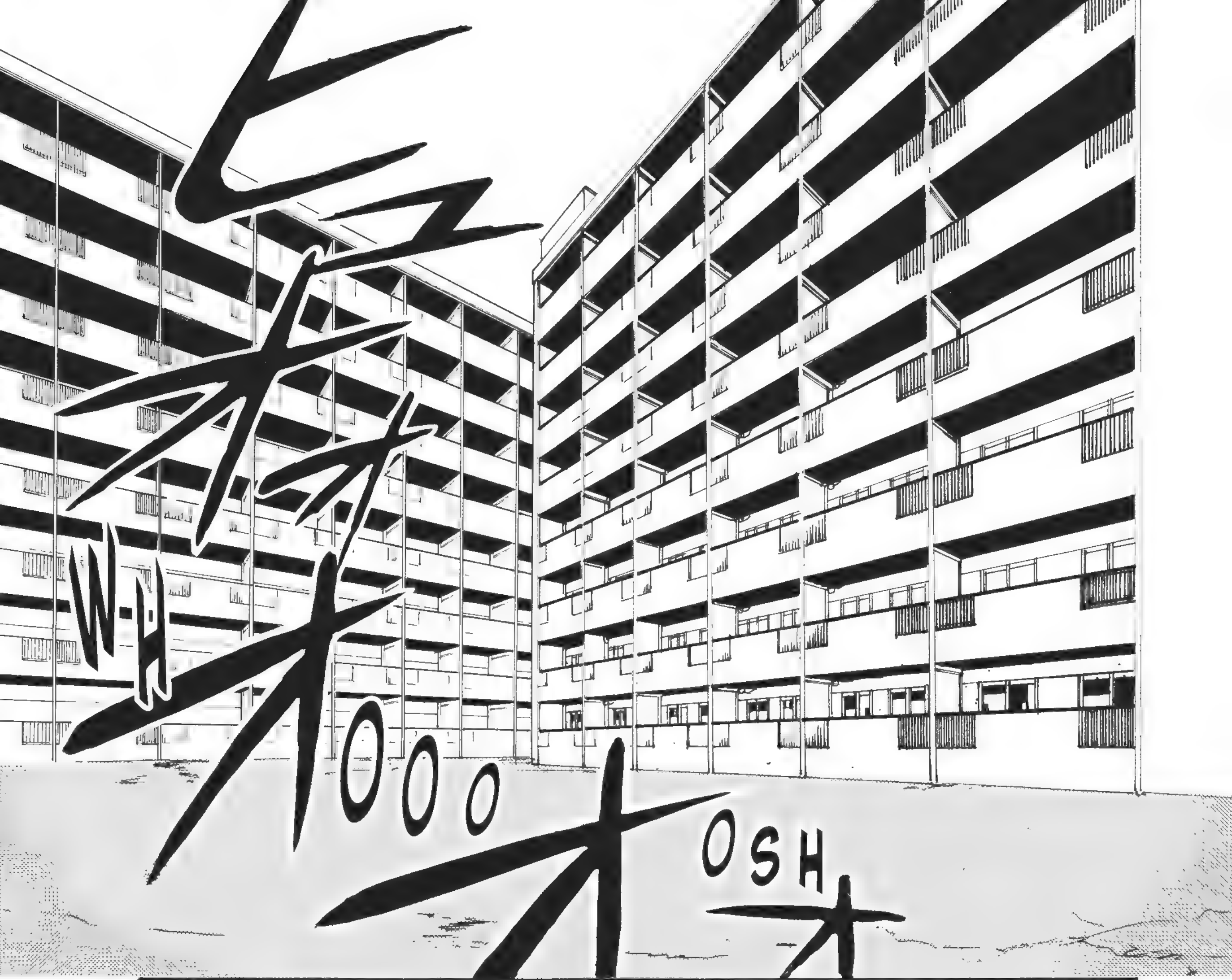

WHAM
PFFT!
AHHH HA HA! YOU WALKED RIGHT INTO IT!!!
AH HA HA!
HILARIOUS!
S-SORRY!
HEY, NK, CUT IT OUT ALREADY!
WHAT?! YOU DIDN'T HAVE TO FOLLOW ME. STOP COMPLAINING.
STOMPING AND PUNCHING HIM...
LET ME MAKE THIS CLEAR. I'VE GOT NO INTENTION OF WORKING WITH YOU GUYS.
WHITE BLOOD CELL
LOOM

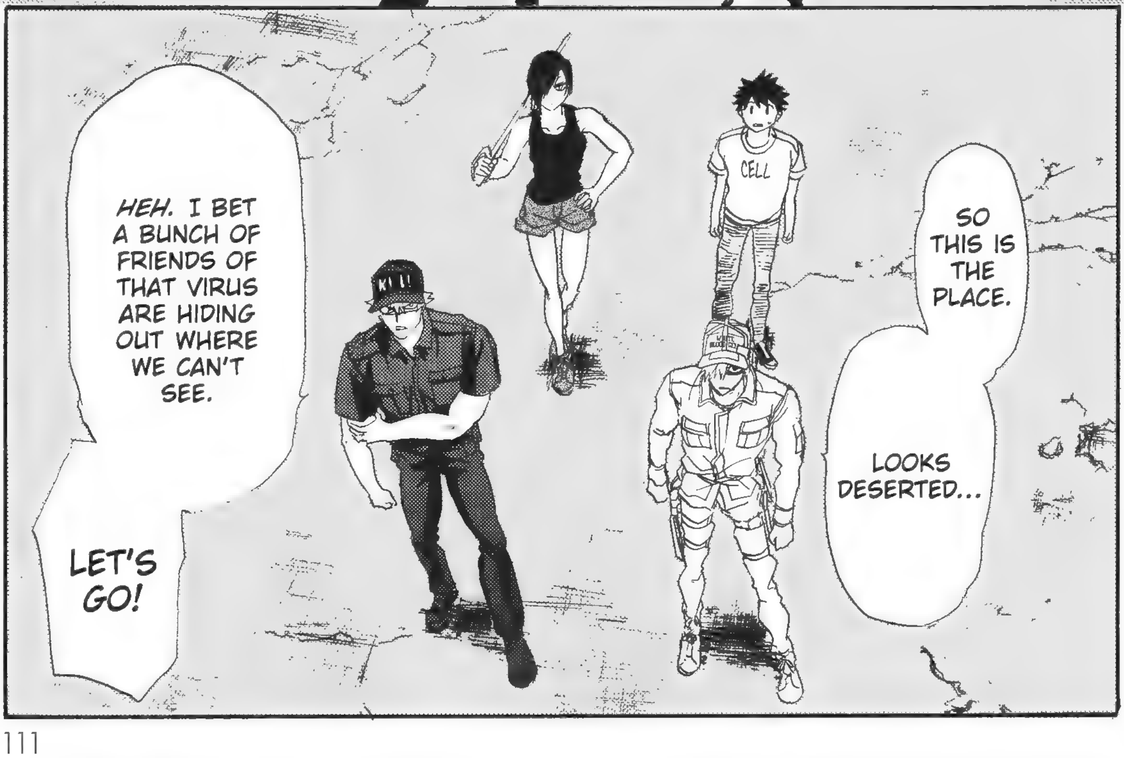

I'LL KILL YOU!!!
HEH! I'D LIKE TO SEE YOU TRY!!
WHAM WHAM
WHAM WHAM
WHOA, THEY'RE KILLING EACH OTHER.
IMMUNE CELLS ARE INTENSE.
WOW... THEY REALLY DON'T GET ALONG.
MAYBE WE SHOULD LEAVE THEM HERE.
NOPE... I GUESS THEY DON'T.
BY THE WAY...
YOU DON'T HAVE TO TAKE US ALL THE WAY THERE.
JUST POINT US IN THE RIGHT DIRECTION.
HUH?
HEH HEH!
OH NO! I GOT THE OLD MAID!
WE'RE ABOUT TO KILL CELLS THAT MIGHT HAVE BEEN YOUR FRIENDS OR NEIGHBORS.
I'M SURE YOU DON'T WANT TO SEE THAT.
OH...
DON'T WORRY ABOUT THAT!
I'M GOING TO TAKE YOU THERE.
IT'S FOR THIS BODY, AFTER ALL!
BESIDES, YOU SAVED ME EARLIER...
...

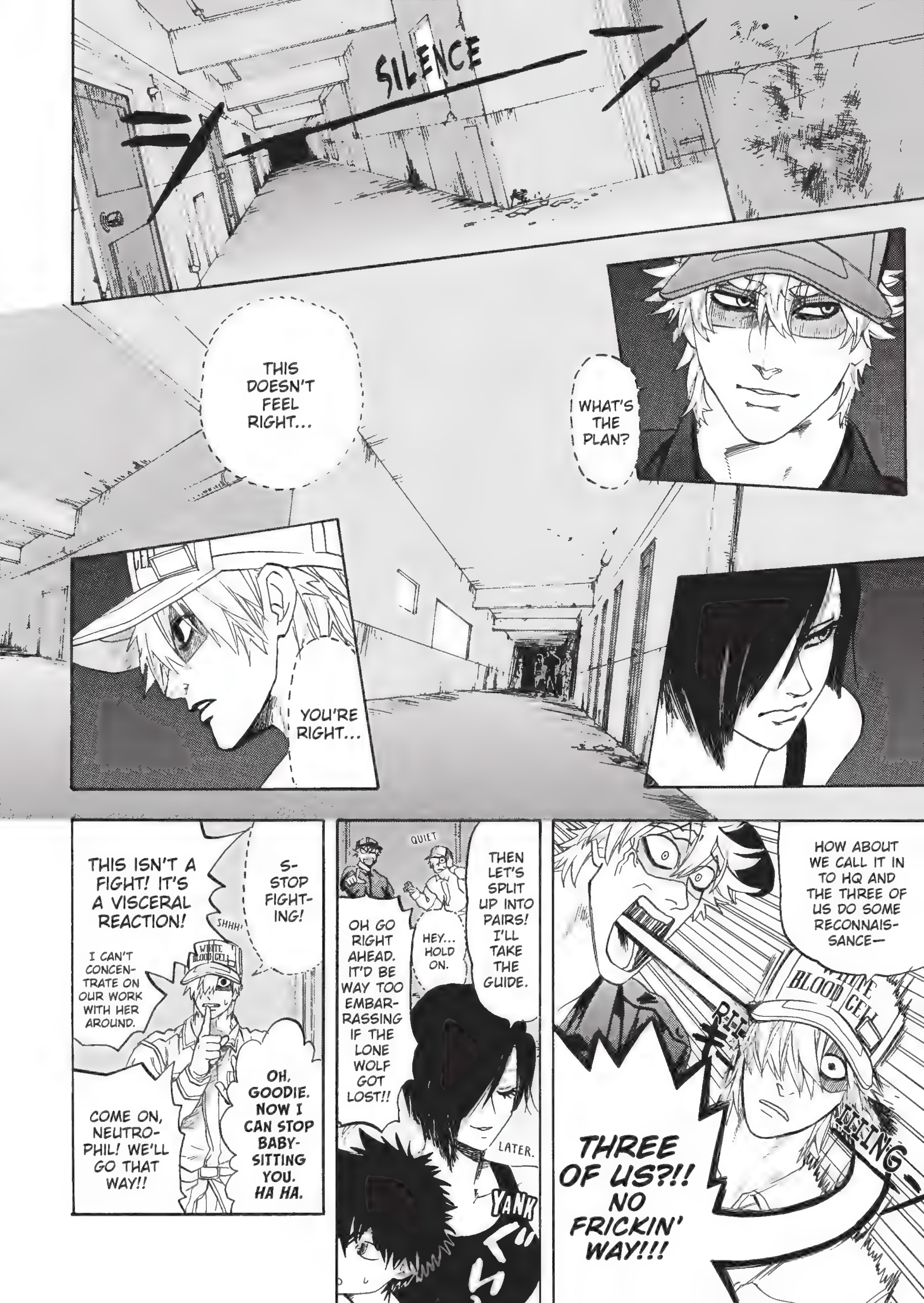

IT'S OKAY... I UNDERSTAND.
I KNOW THAT IT CAN'T HELPED.
SOMETIMES, CELLS HAVE TO DIE TO PRESERVE THE PEACE FOR THE WHOLE BODY.
AND I KNOW THAT'S YOUR JOB.
WHITE BLOOD CELL
1146
I SEE.
I'M GLAD...
I HAVE TO SAY, THOUGH... HA HA. I NEVER THOUGHT THERE WERE IMMUNE CELLS WHO CARED ABOUT STUFF LIKE THAT.
HEH HEH HEE!
NEVER SEEN THAT BEFORE.
GUH...
W-WELL, I DO.
I CAN'T TALK ABOUT IT MUCH, OUT OF CONSIDERATION FOR KILLER T AND HIS FRIENDS.
CELL
VICTORY IS MINE!
HUSTLE ガヤ
SCRAP COLLECTION
BUSTLE ガヤ
SNAP
OH!
AA5100
HM? WHAT'S WRONG?

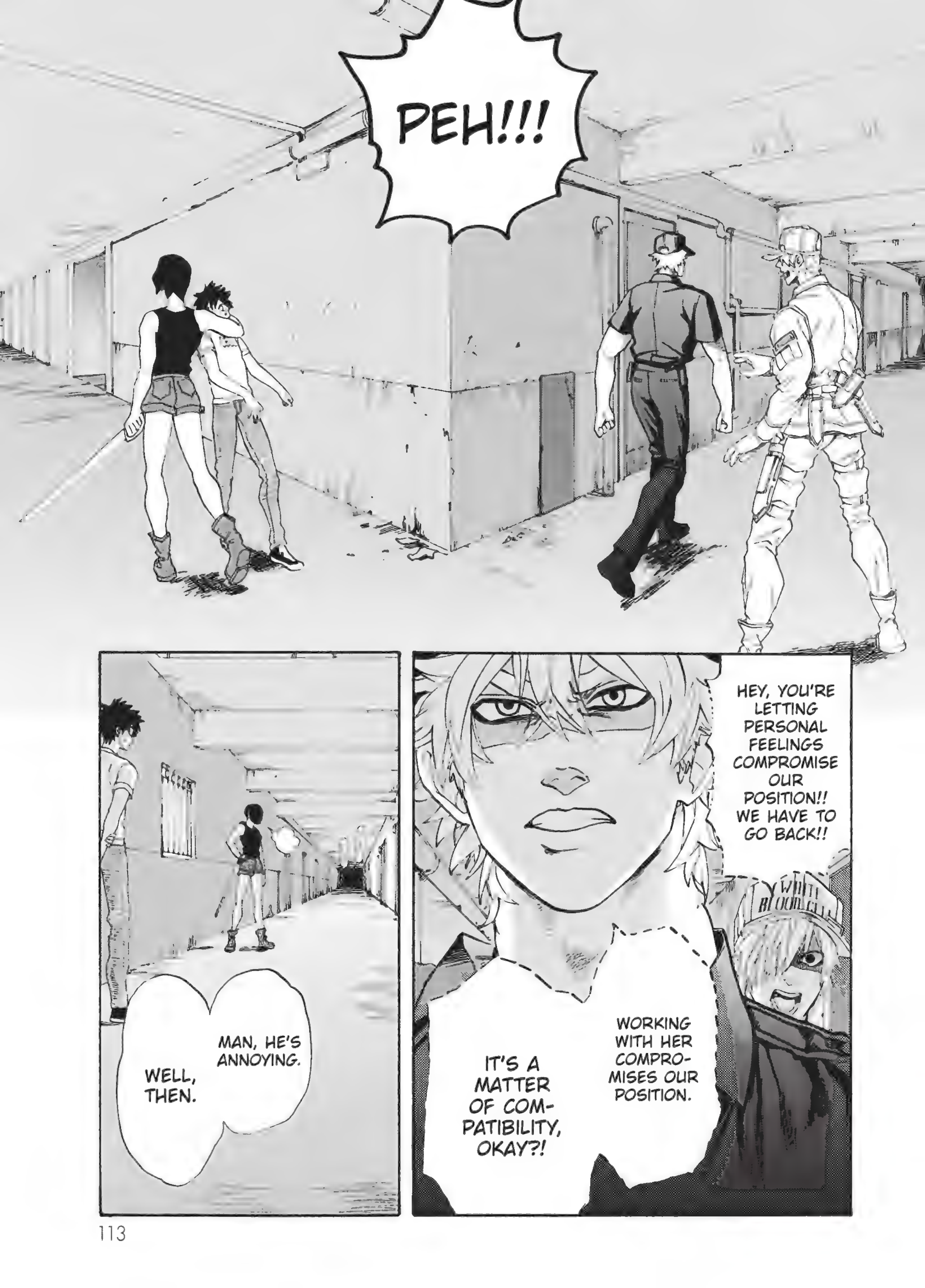

AE 3803
M-MY SHOELACE BROKE.
OH MY... THAT'S BAD LUCK.
GO WALK AHEAD. I'LL CATCH UP.
BAD OMEN #1: SHOELACE BREAKS.
H-HEY, CAREFUL!
YOU'RE WALKING UNDER A LADDER...!!
THAT'S BAD LUCK!
OH! OOPS!
BAD OMEN #2: WALKING UNDER A LADDER.
WHAM
OH, SORRY...
廃棄
OH, NO, THE DISHES!! THAT'S MORE BAD LUCK!!
CRASH
CRASH
SMASH
CRASH
CRAAASH
...WHAT ARE YOU DOING?!
BAD OMEN #3: BREAKING DISHES
S-SORRY, I'LL HELP PICK IT UP!
STIR
HUH?!
BAD OMEN #4: HAIRS STICKING UP
ANOTHER OMEN...?!
STIR
STIR
PARANORMAL...?!
WHAT IS THIS...? I'VE GOT A BAD FEELING...
OH... IT STOPPED.

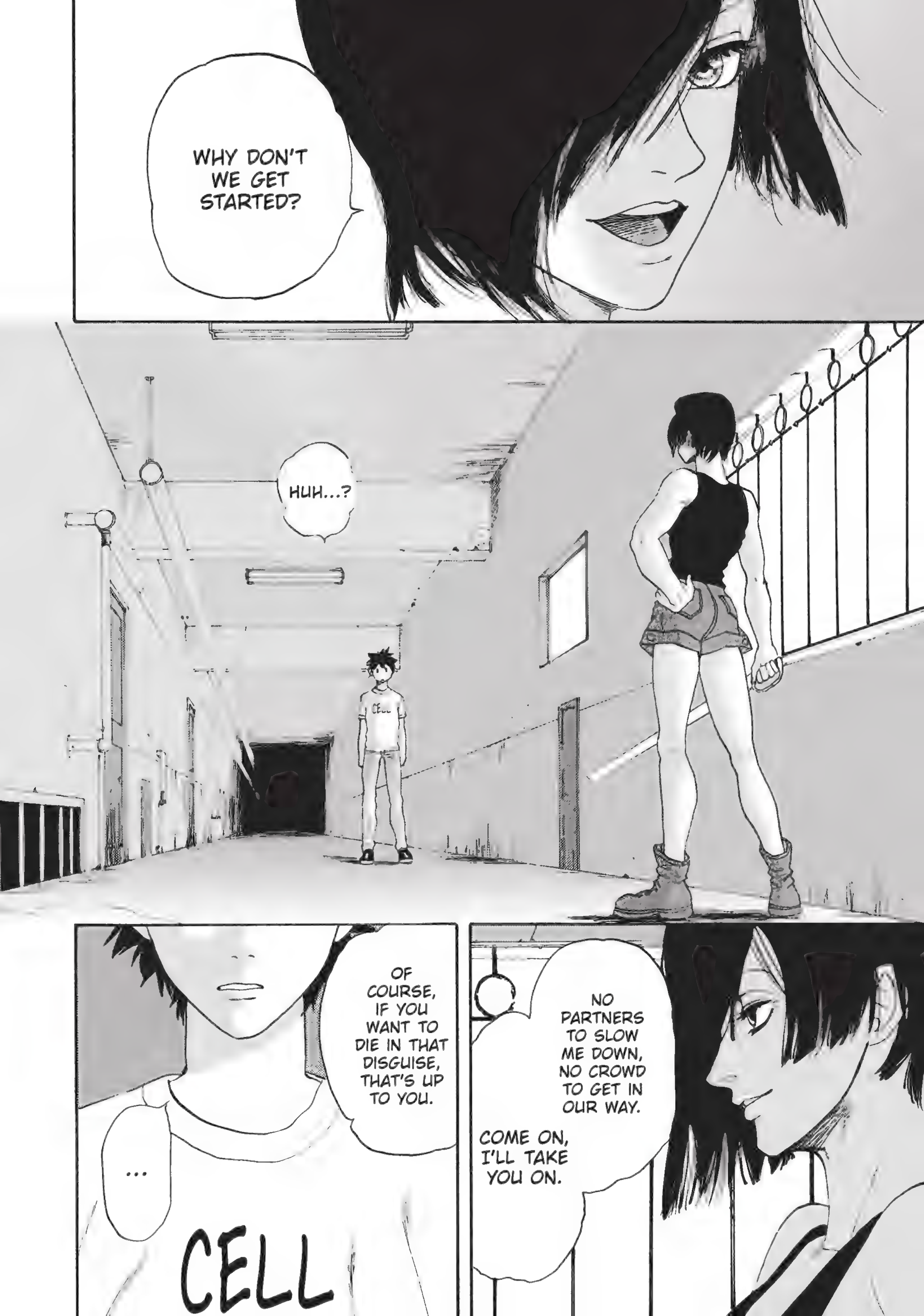
Red Blood Cell
She transports oxygen and carbon dioxide through blood circulation.

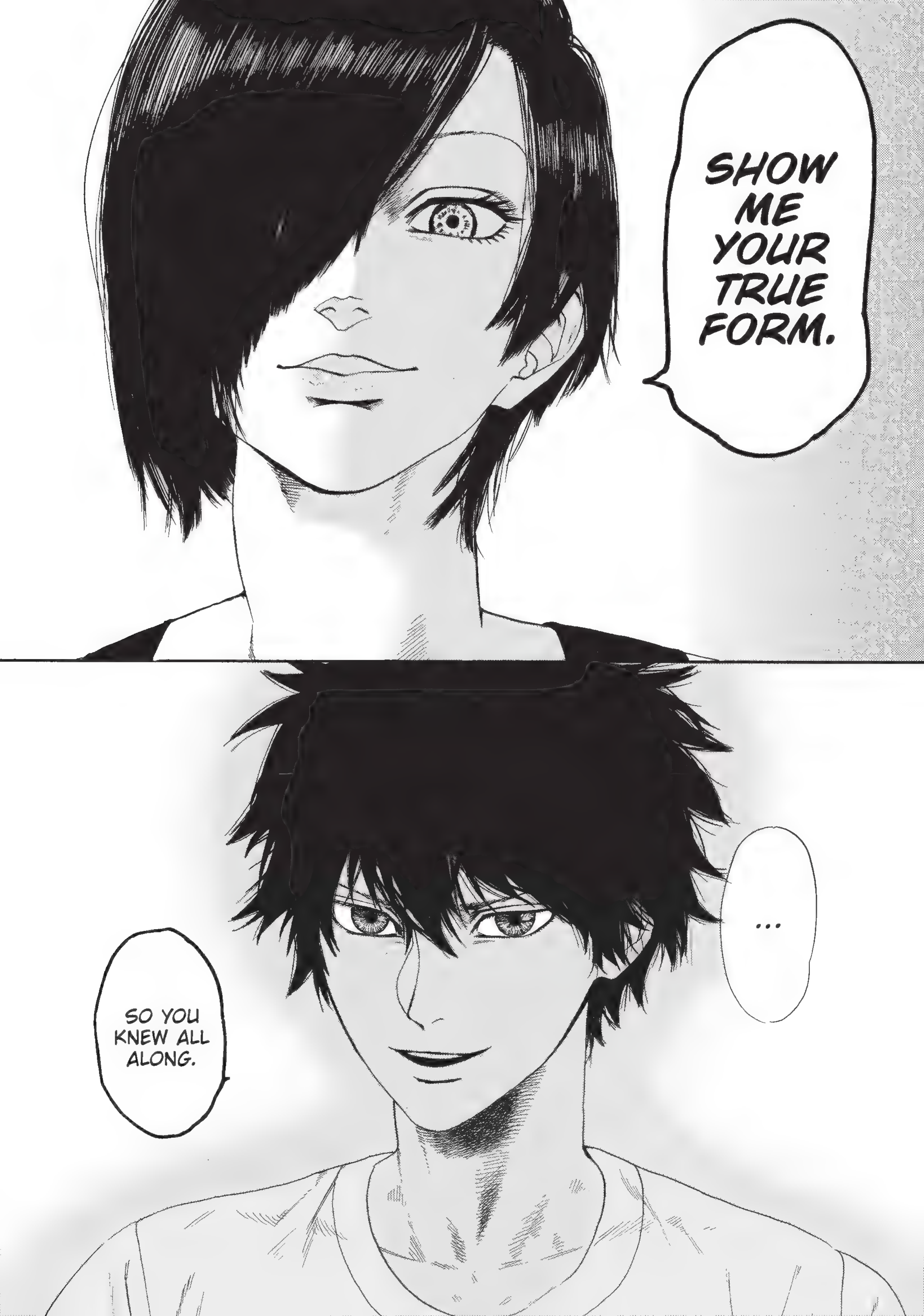

W-H
OOOO
OSH

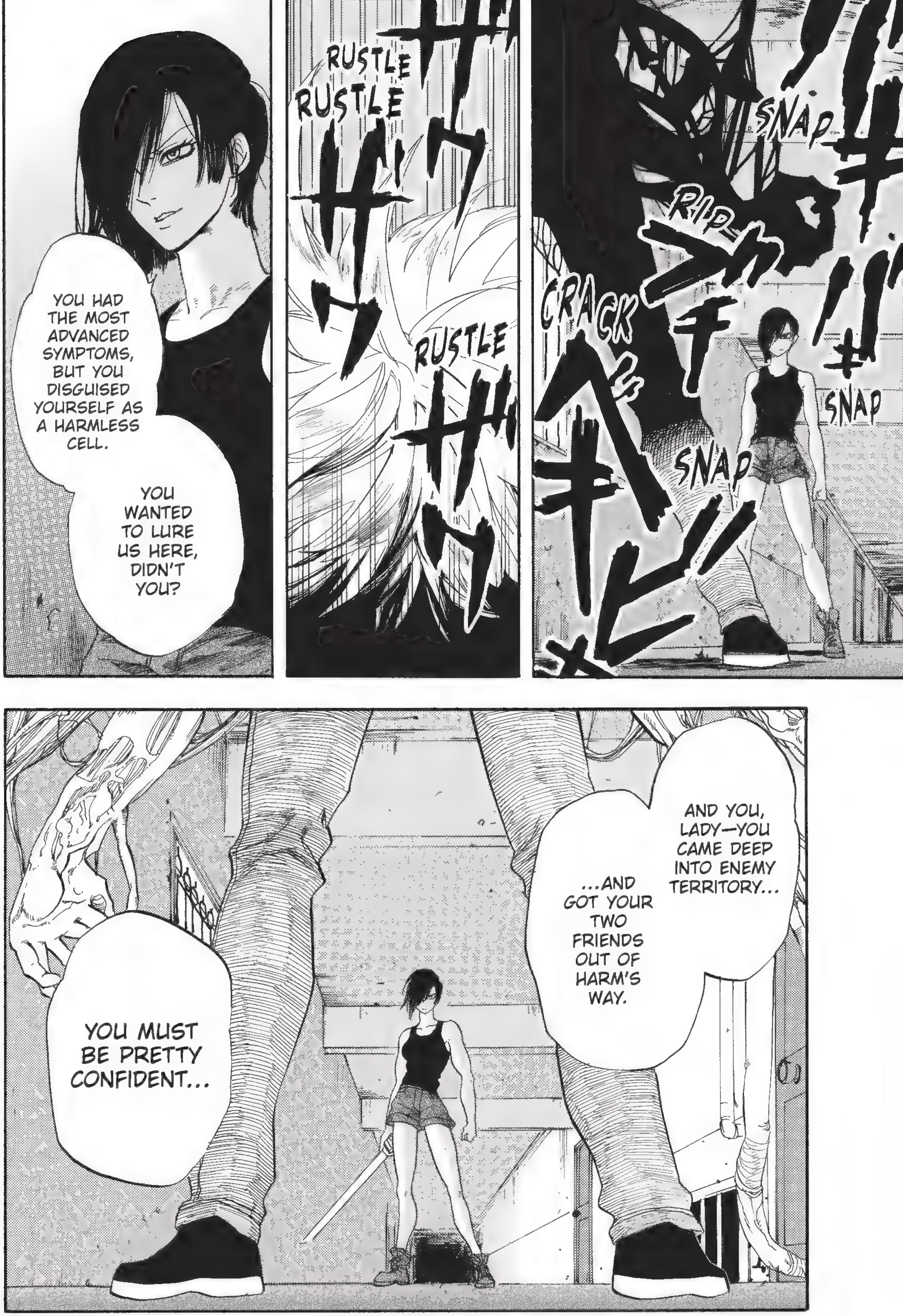

SO THIS IS THE PLACE.
LOOKS DESERTED...
CELL
HEH. I BET A BUNCH OF FRIENDS OF THAT VIRUS ARE HIDING OUT WHERE WE CAN'T SEE.
LET'S GO!

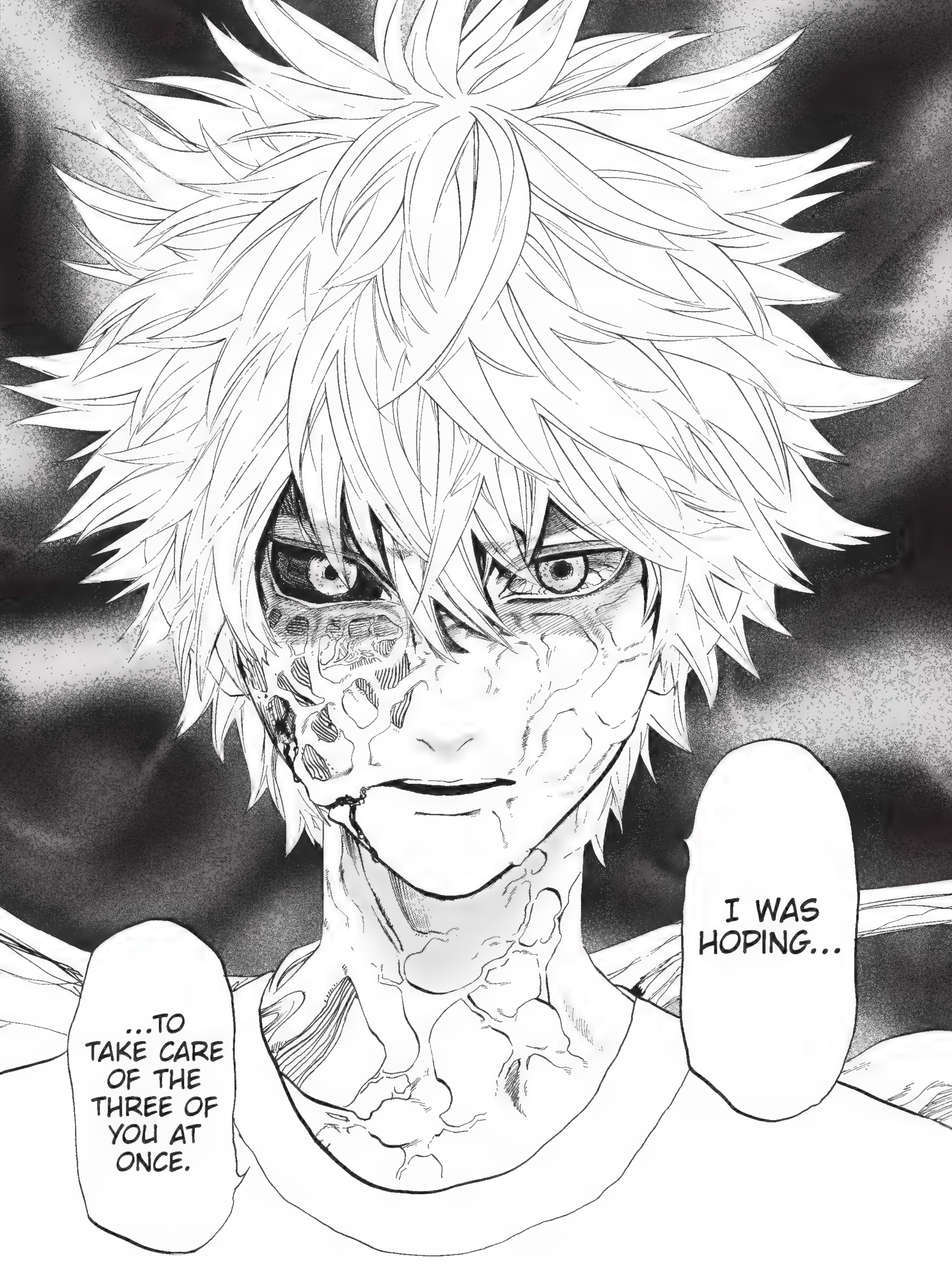

SILENCE
WHAT'S THE PLAN?
THIS DOESN'T FEEL RIGHT…
YOU'RE RIGHT…
HOW ABOUT WE CALL IT IN TO HQ AND THE THREE OF US DO SOME RECONNAISSANCE—
RIIIING
THREE OF US?!! NO FRICKIN' WAY!!!
QUIET
THEN LET'S SPLIT UP INTO PAIRS! I'LL TAKE THE GUIDE.
HEY… HOLD ON.
OH GO RIGHT AHEAD. IT'D BE WAY TOO EMBARRASSING IF THE LONE WOLF GOT LOST!!
LATER.
YANK
S-STOP FIGHTING!
THIS ISN'T A FIGHT! IT'S A VISCERAL REACTION!
SHHH!
I CAN'T CONCENTRATE ON OUR WORK WITH HER AROUND.
OH, GOODIE. NOW I CAN STOP BABYSITTING YOU. HA HA.
COME ON, NEUTROPHIL! WE'LL GO THAT WAY!!

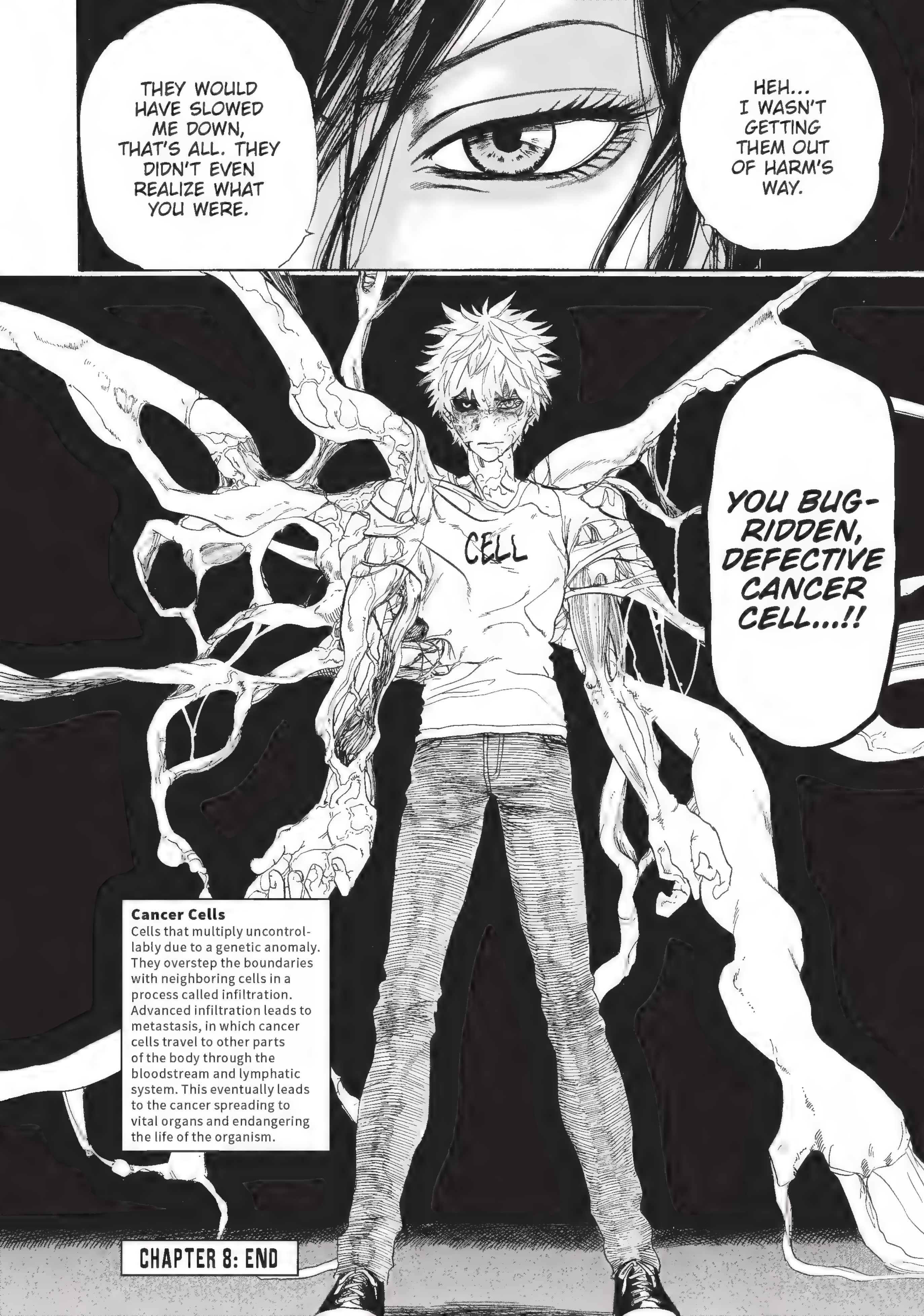

PEH!!!
HEY, YOU'RE LETTING PERSONAL FEELINGS COMPROMISE OUR POSITION!! WE HAVE TO GO BACK!!
WORKING WITH HER COMPROMISES OUR POSITION.
IT'S A MATTER OF COMPATIBILITY, OKAY?!
MAN, HE'S ANNOYING.
WELL, THEN.


WHY DON'T WE GET STARTED?
HUH...?
CELL
NO PARTNERS TO SLOW ME DOWN, NO CROWD TO GET IN OUR WAY.
COME ON, I'LL TAKE YOU ON.
OF COURSE, IF YOU WANT TO DIE IN THAT DISGUISE, THAT'S UP TO YOU.
...
CELL


SHOW ME YOUR TRUE FORM.
...
SO YOU KNEW ALL ALONG.


SNAP
RIP
CRACK
SNAP
SNAP
RUSTLE
RUSTLE
RUSTLE
YOU HAD THE MOST ADVANCED SYMPTOMS, BUT YOU DISGUISED YOURSELF AS A HARMLESS CELL.
YOU WANTED TO LURE US HERE, DIDN'T YOU?
AND YOU, LADY—YOU CAME DEEP INTO ENEMY TERRITORY...
...AND GOT YOUR TWO FRIENDS OUT OF HARM'S WAY.
YOU MUST BE PRETTY CONFIDENT...

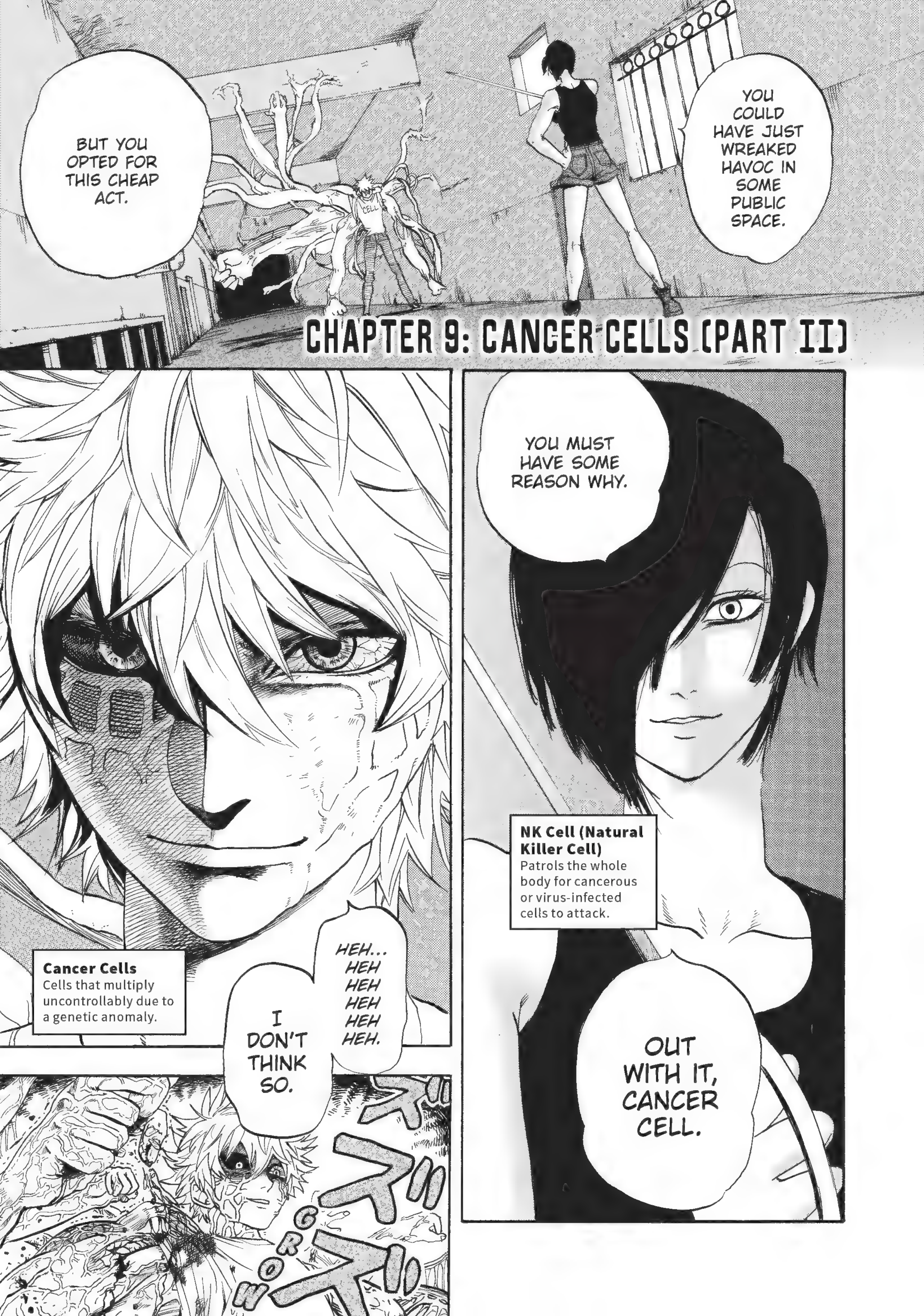

I WAS HOPING...
...TO TAKE CARE OF THE THREE OF YOU AT ONCE.


HEH... I WASN'T GETTING THEM OUT OF HARM'S WAY.
THEY WOULD HAVE SLOWED ME DOWN, THAT'S ALL. THEY DIDN'T EVEN REALIZE WHAT YOU WERE.
YOU BUG-RIDDEN, DEFECTIVE CANCER CELL...!!
CELL

Cancer Cells
Cells that multiply uncontrollably due to a genetic anomaly. They overstep the boundaries with neighboring cells in a process called infiltration. Advanced infiltration leads to metastasis, in which cancer cells travel to other parts of the body through the bloodstream and lymphatic system. This eventually leads to the cancer spreading to vital organs and endangering the life of the organism.

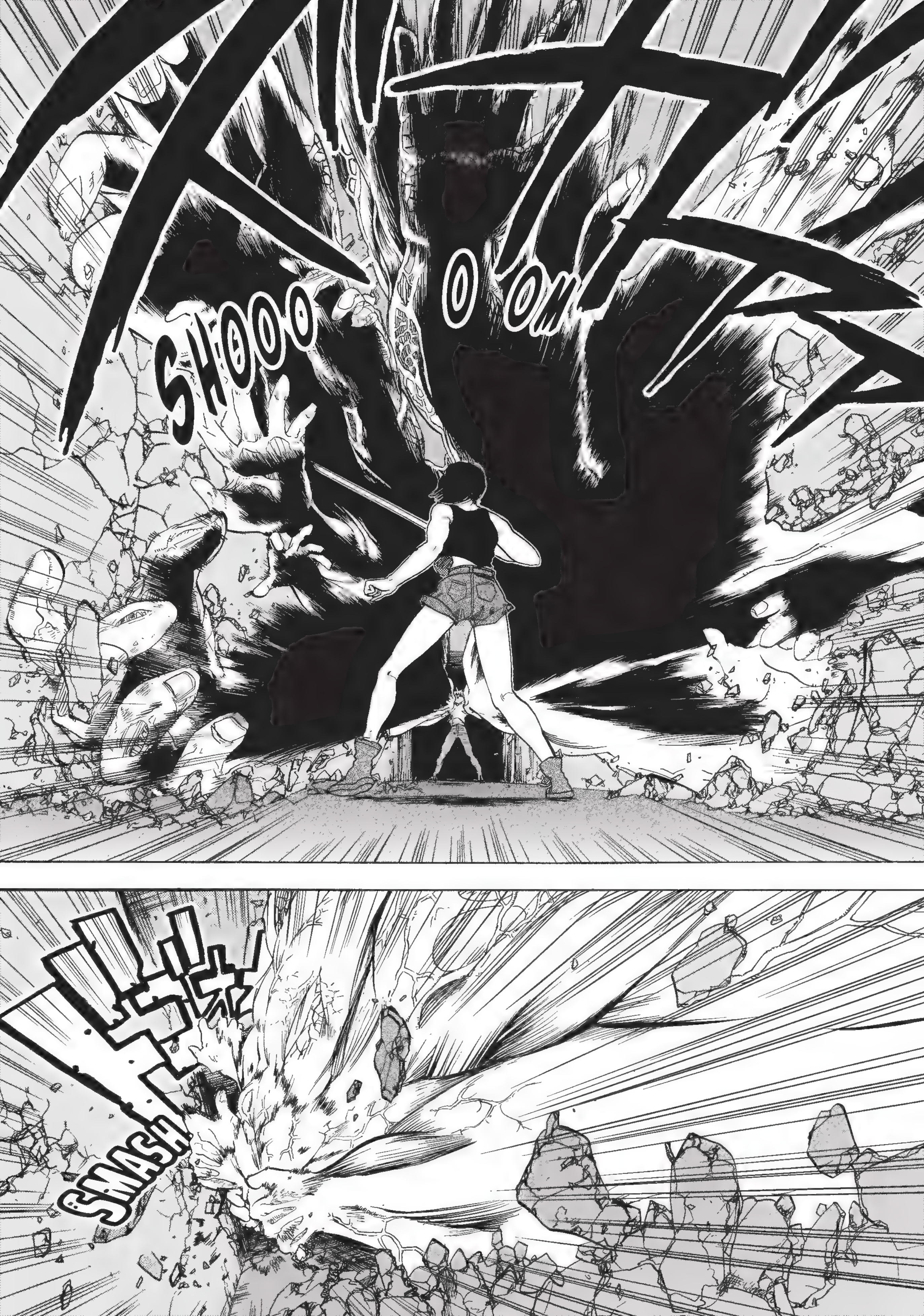
CHAPTER 8: END

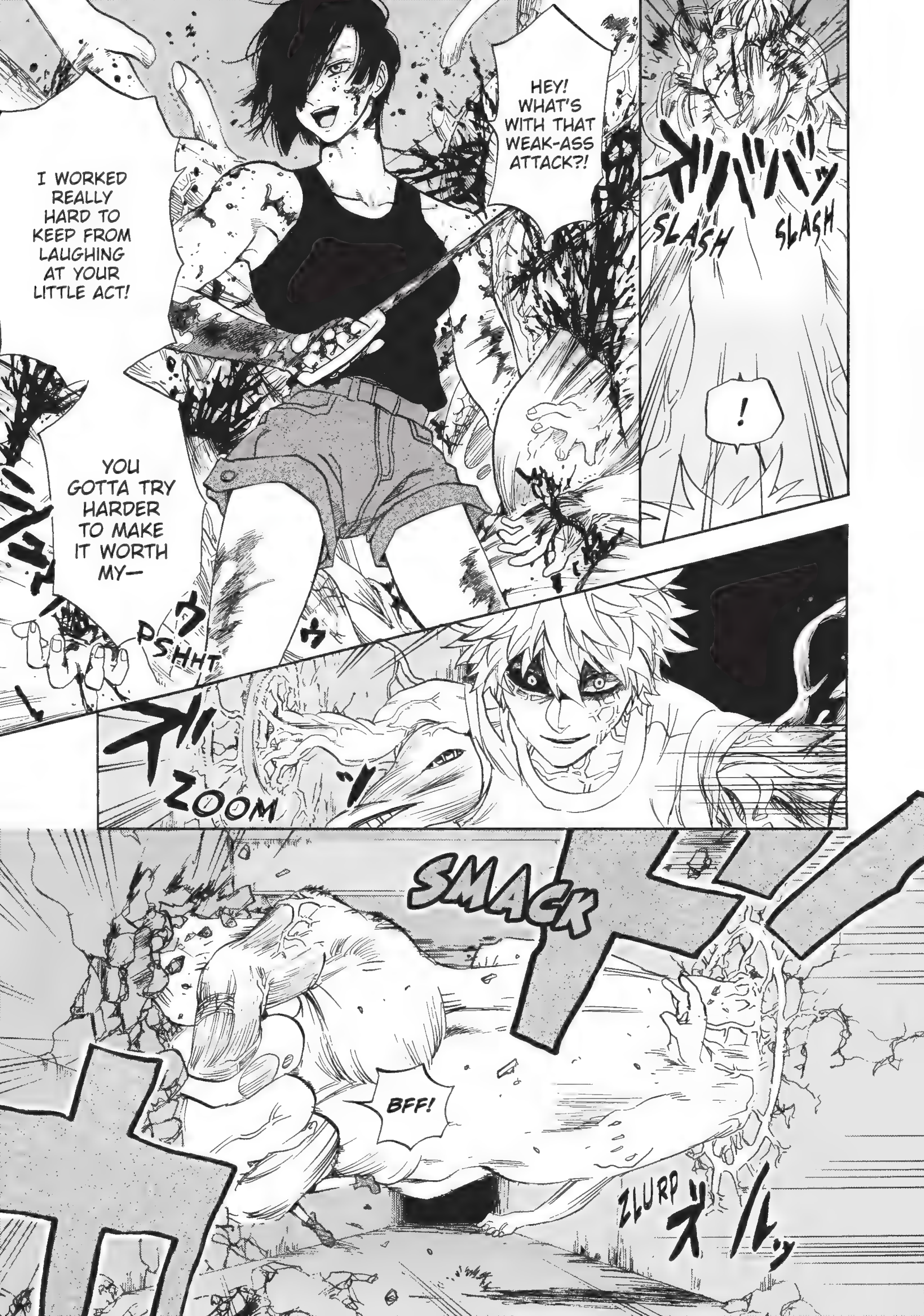
CHAPTER 9: CANCER CELLS (PART II)

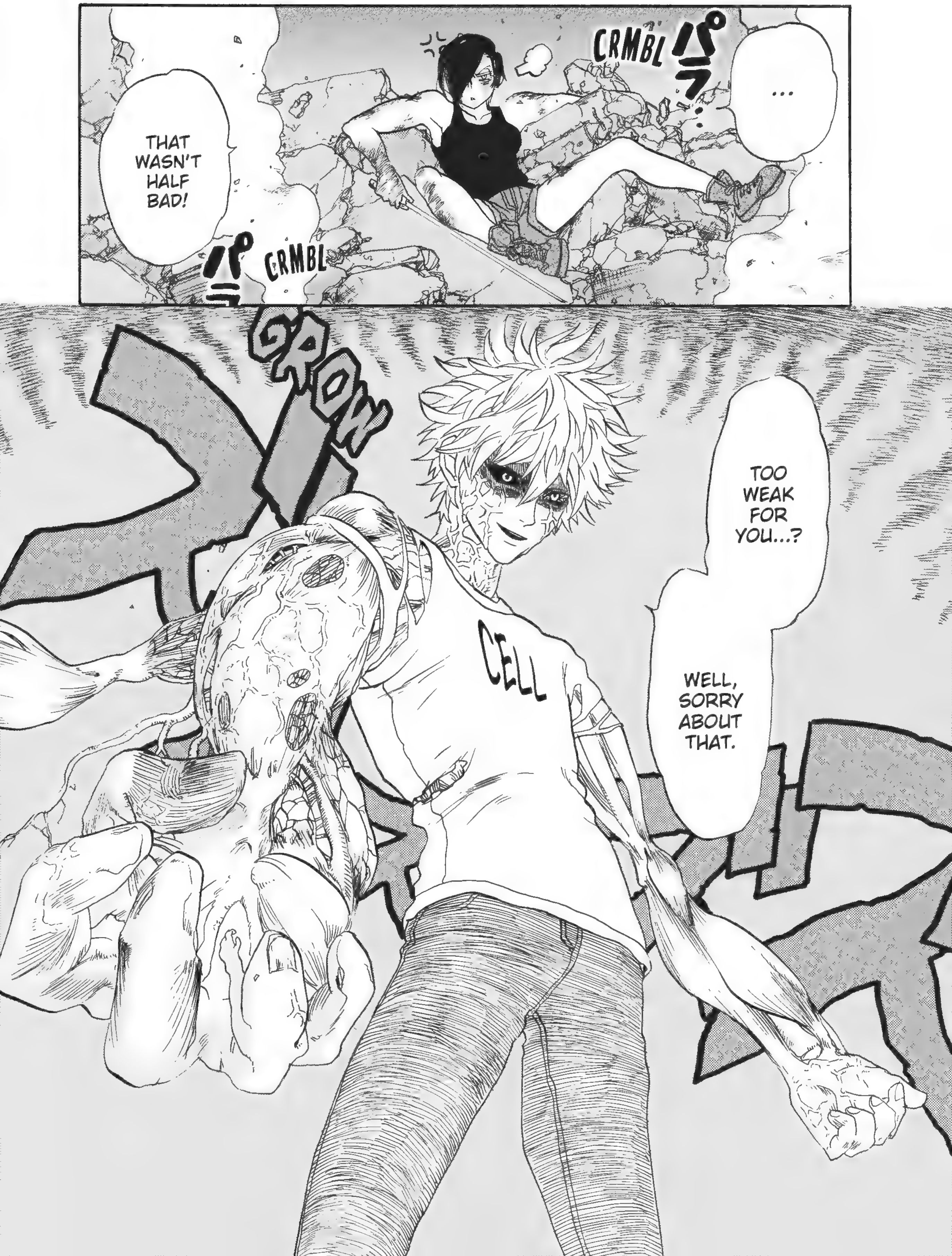

YOU COULD HAVE JUST WREAKED HAVOC IN SOME PUBLIC SPACE.
BUT YOU OPTED FOR THIS CHEAP ACT.
CELL
YOU MUST HAVE SOME REASON WHY.
OUT WITH IT, CANCER CELL.
HEH... HEH HEH HEH HEH HEH.
I DON'T THINK SO.
GROW

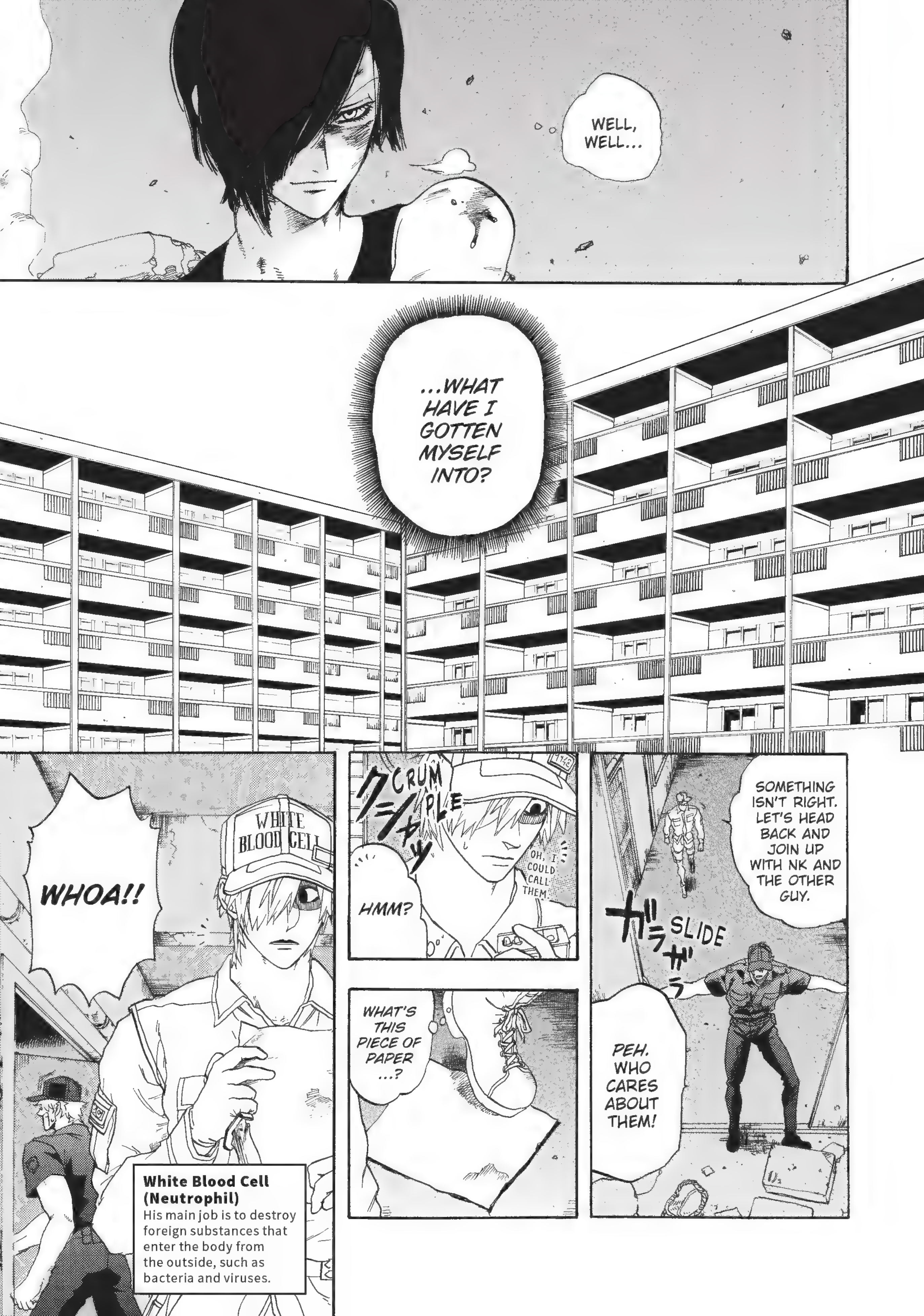
NK Cell (Natural Killer Cell)
Patrols the whole body for cancerous or virus-infected cells to attack.

Cancer Cells
Cells that multiply uncontrollably due to a genetic anomaly.

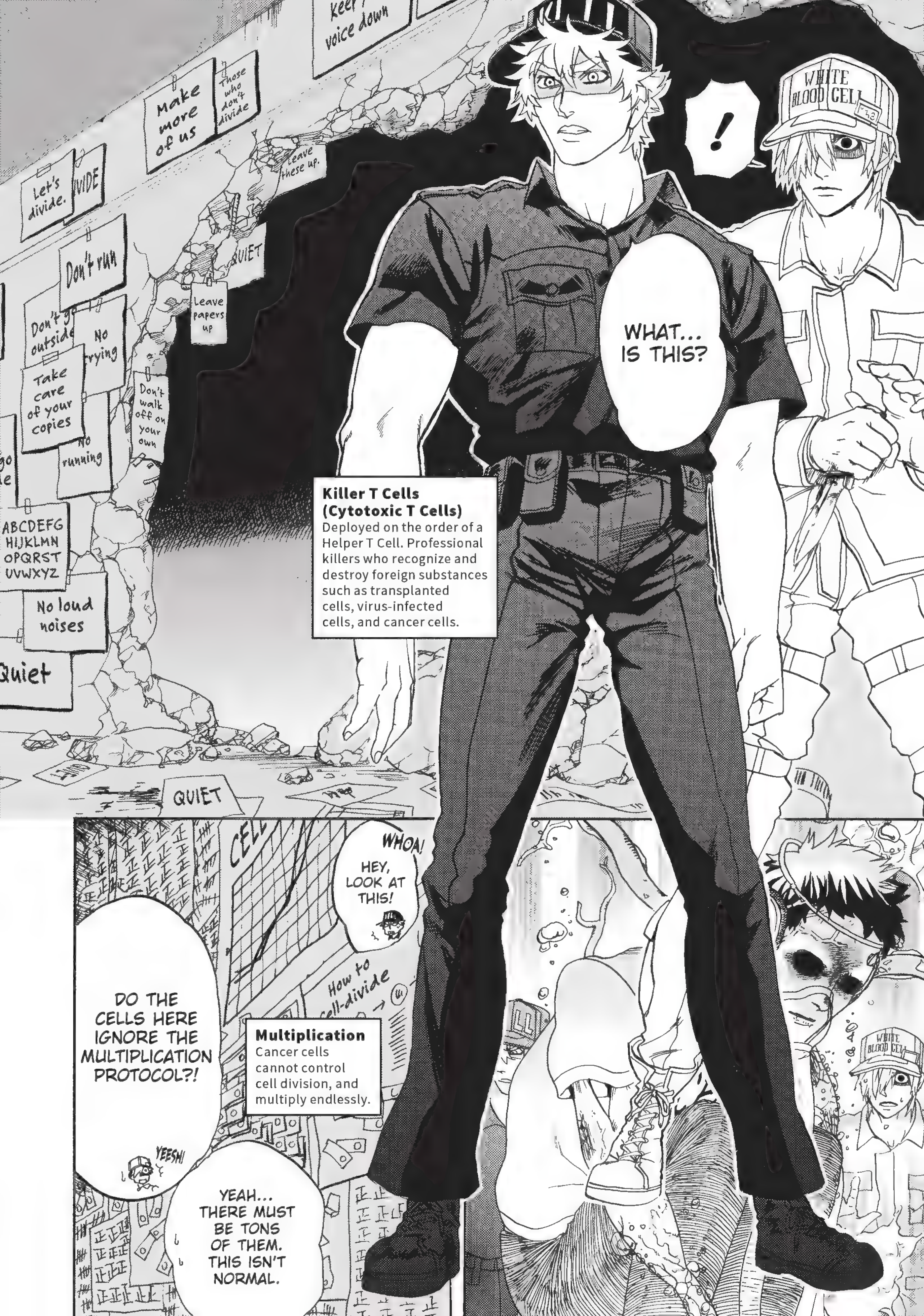

SHOOOOOM
SMASH


SLASH SLASH
!
HEY! WHAT'S WITH THAT WEAK-ASS ATTACK?!
I WORKED REALLY HARD TO KEEP FROM LAUGHING AT YOUR LITTLE ACT!
YOU GOTTA TRY HARDER TO MAKE IT WORTH MY—
PSHHT
ZOOM
SMACK
BFF!
ZLURP
ズルッ


...
CRMBL パラ
THAT WASN'T HALF BAD!
パラ CRMBL
GROW
TOO WEAK FOR YOU...?
WELL, SORRY ABOUT THAT.
CELL

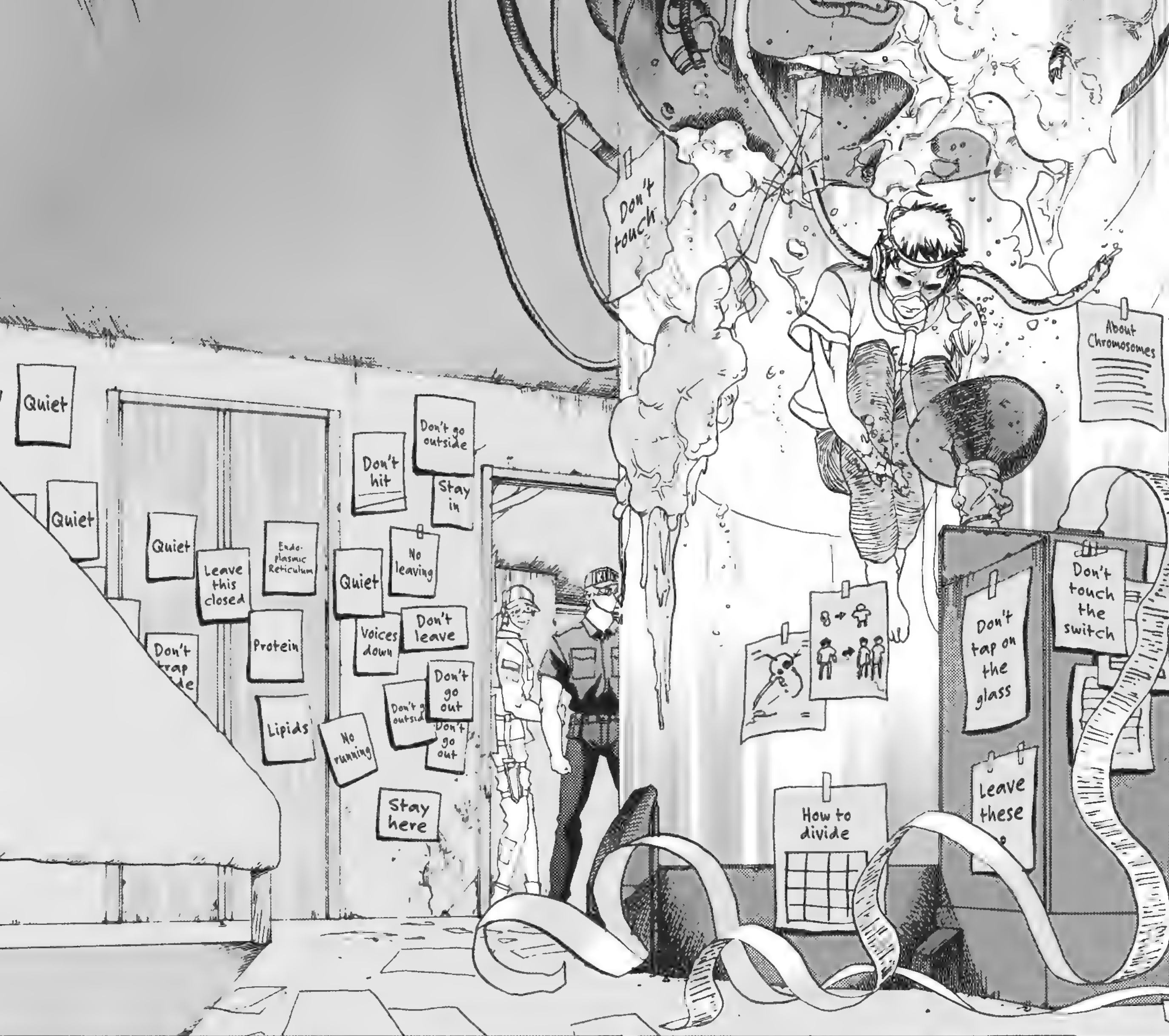

WELL, WELL...
...WHAT HAVE I GOTTEN MYSELF INTO?
SOMETHING ISN'T RIGHT. LET'S HEAD BACK AND JOIN UP WITH NK AND THE OTHER GUY.
ガラガラ
SLIDE
PEH. WHO CARES ABOUT THEM!
クシャッ
CRUMPLE
HMM?
OH, I COULD CALL THEM.
WHAT'S THIS PIECE OF PAPER ...?
WHOA!!
WHITE BLOOD CELL

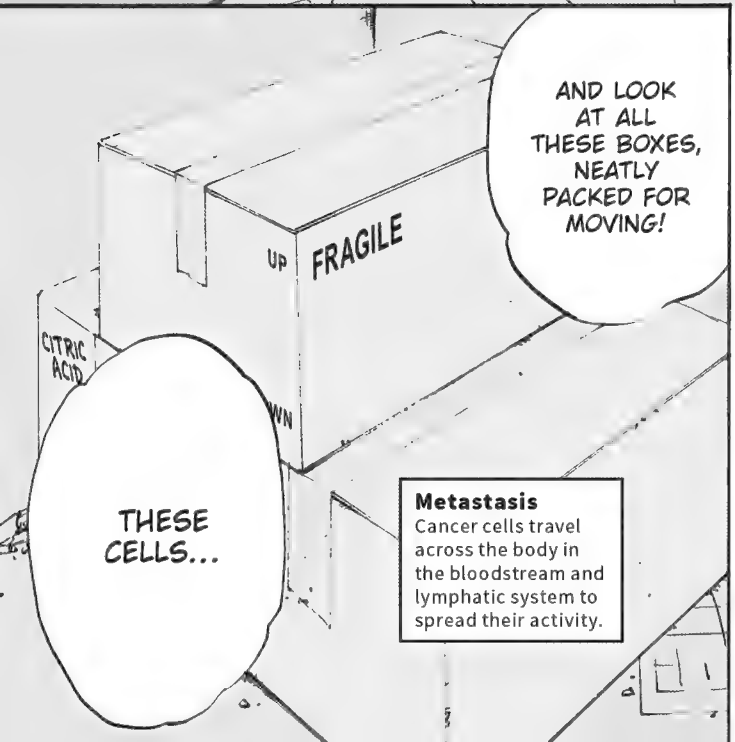
White Blood Cell (Neutrophil)
His main job is to destroy foreign substances that enter the body from the outside, such as bacteria and viruses.


!
WHAT... IS THIS?
WHITE BLOOD CELL
kee
voice down
Those who don't divide
Make more of us
Leave these up.
IVIDE
Let's divide.
QUIET
Don't run
Leave papers up
No crying
Don't go outside
Don't walk off on your own
Take care of your copies
No running
ABCDEFG
HIJKLMN
OPQRST
UVWXYZ
No loud noises
Quiet
QUIET
QUIET
WHOA!
HEY, LOOK AT THIS!
CELL
How to cell-divide
DO THE CELLS HERE IGNORE THE MULTIPLICATION PROTOCOL?!
YEESH
YEAH... THERE MUST BE TONS OF THEM. THIS ISN'T NORMAL.
WHITE BLOOD CELL

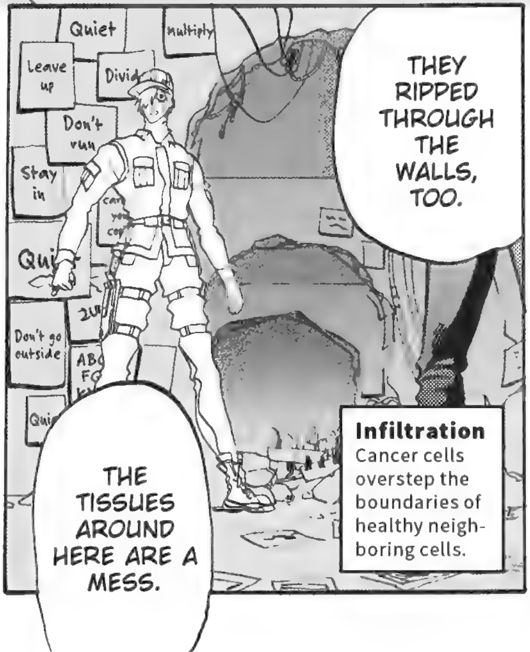
Killer T Cells (Cytotoxic T Cells)
Deployed on the order of a Helper T Cell. Professional killers who recognize and destroy foreign substances such as transplanted cells, virus-infected cells, and cancer cells.

Multiplication
Cancer cells cannot control cell division, and multiply endlessly.

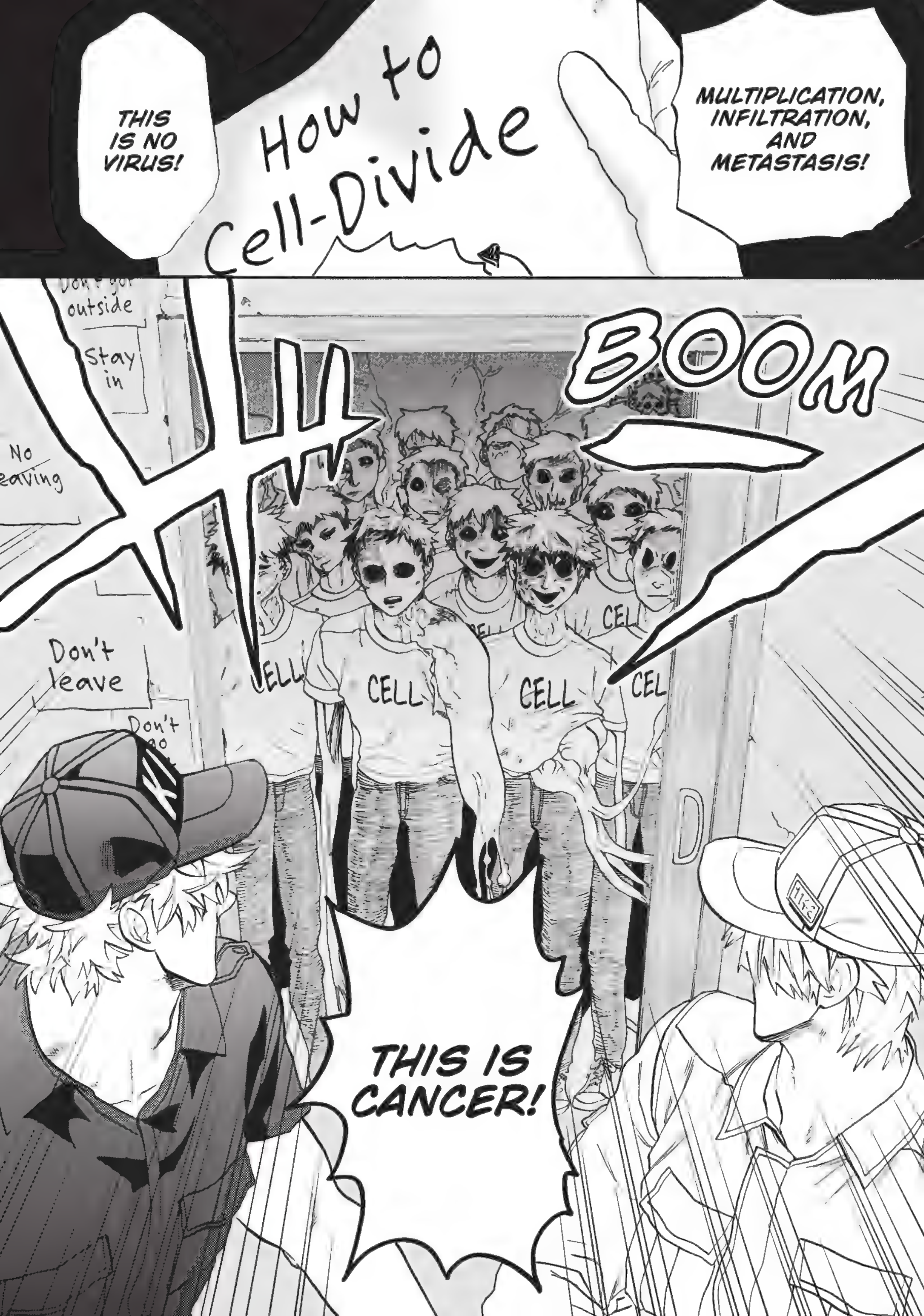

Don't touch
About Chromosomes
Don't touch the switch
Don't tap on the glass
Leave these
How to divide
Quiet
Quiet
Quiet
Leave this closed
Endoplasmic Reticulum
Protein
Lipids
Don't go outside
Don't hit
Stay in
Quiet
No leaving
Voices down
Don't leave
Don't go out
Don't go outside
Don't go out
No running
Stay here

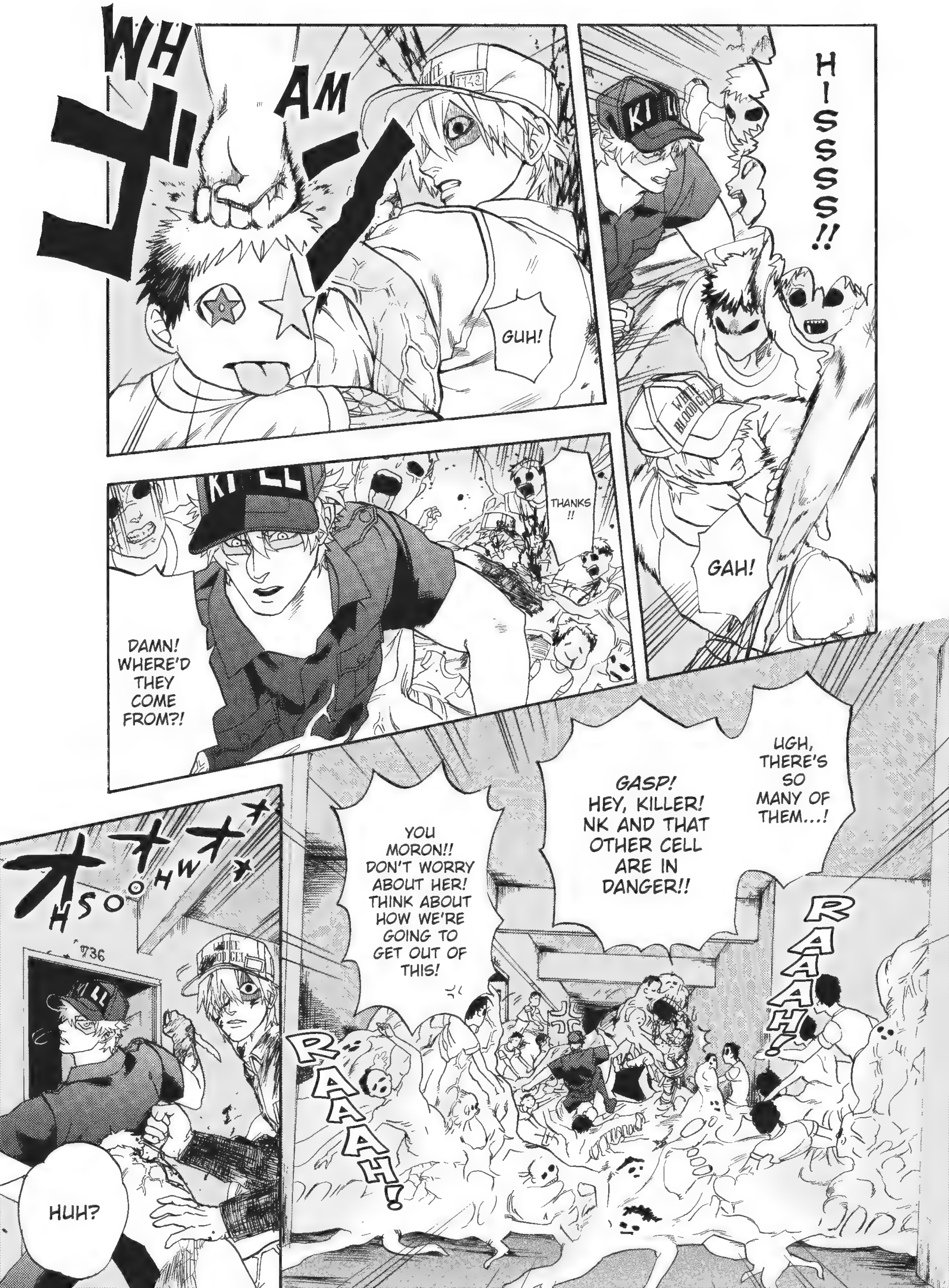

THESE CELLS...
AND LOOK AT ALL THESE BOXES, NEATLY PACKED FOR MOVING!
UP
FRAGILE
CITRIC ACID

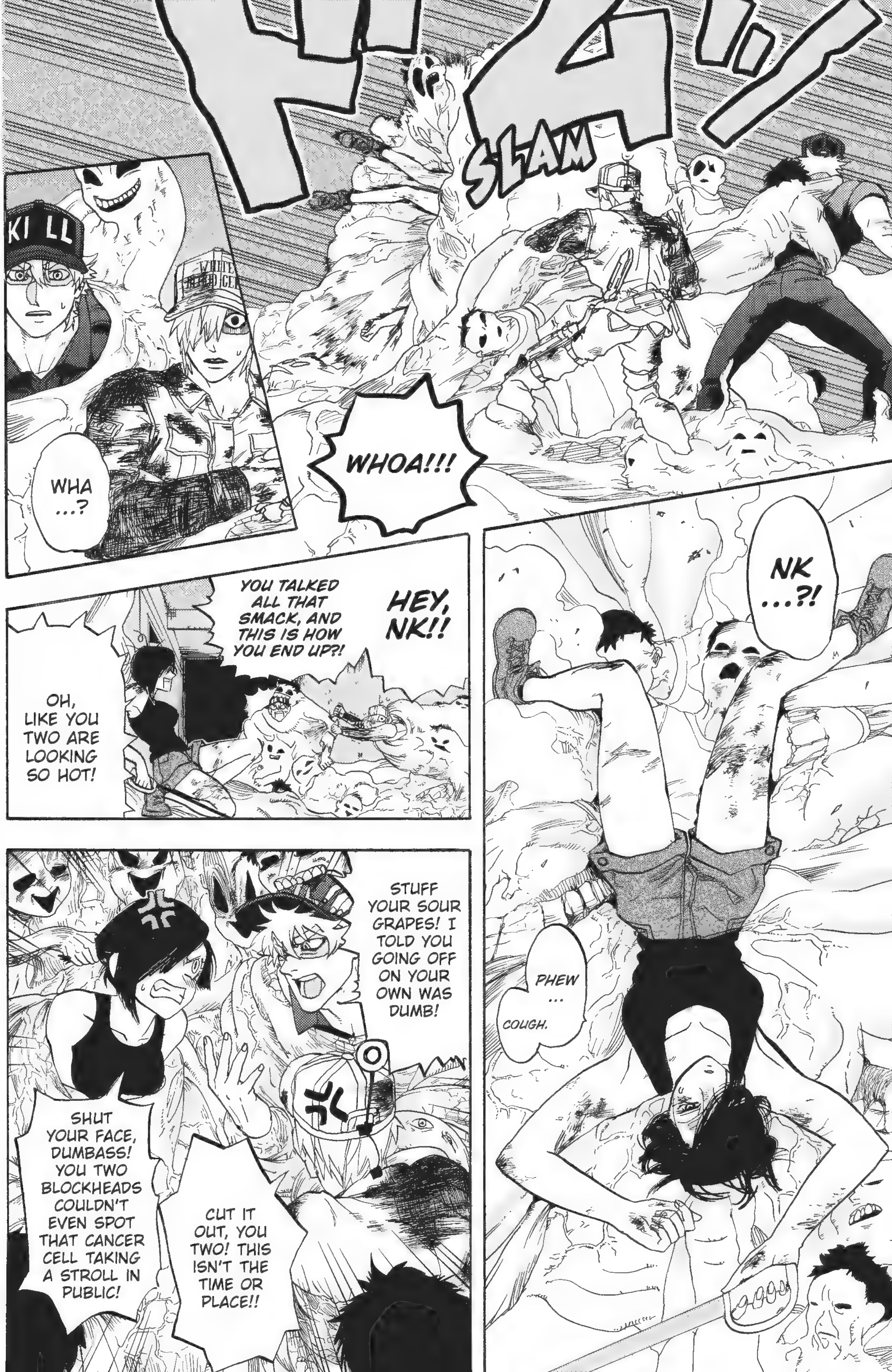
Metastasis
Cancer cells travel across the body in the bloodstream and lymphatic system to spread their activity.

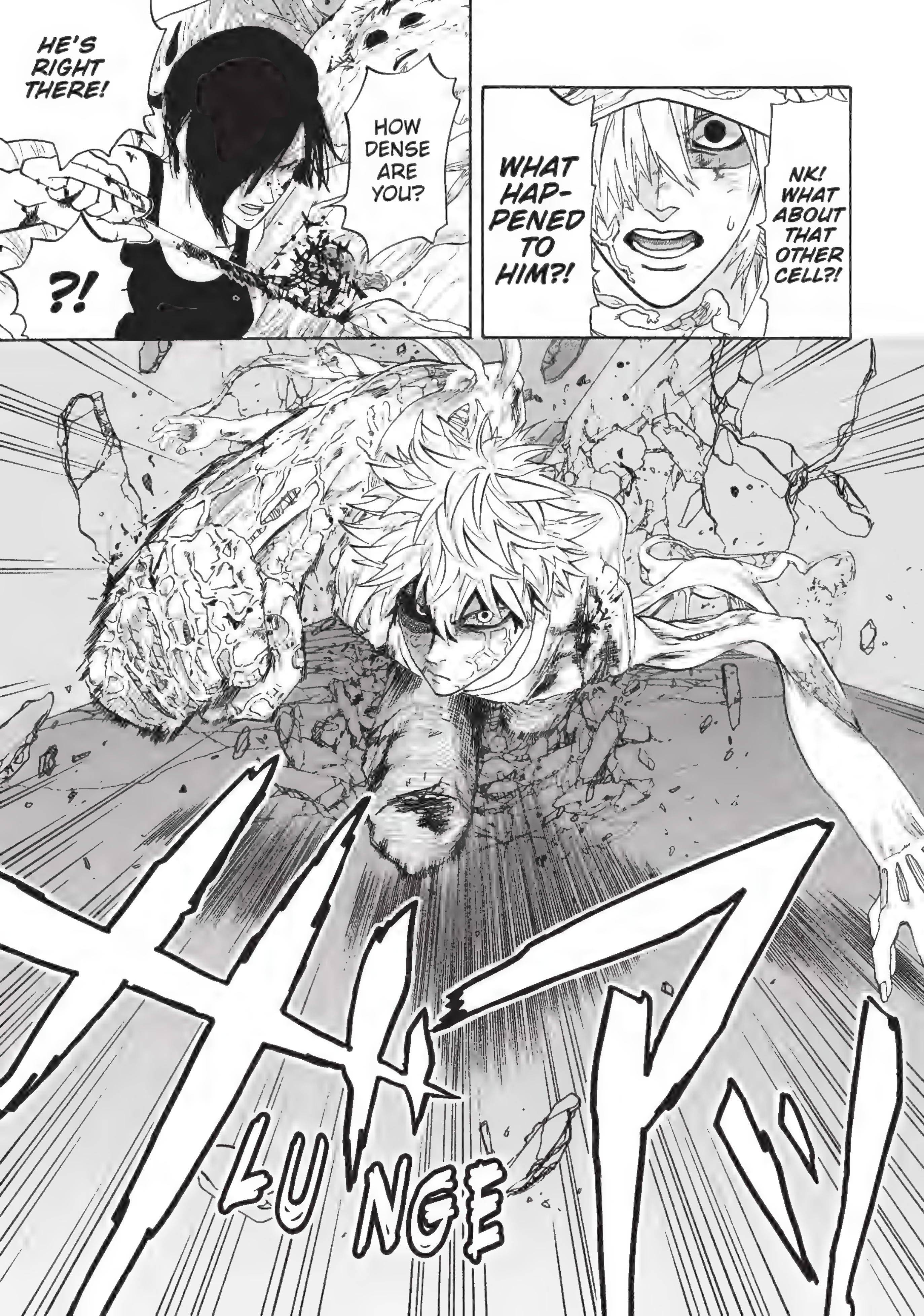

THE TISSUES AROUND HERE ARE A MESS.
THEY RIPPED THROUGH THE WALLS, TOO.
Quiet
multiply
Leave up
Divid
Don't run
Stay in
Don't go outside

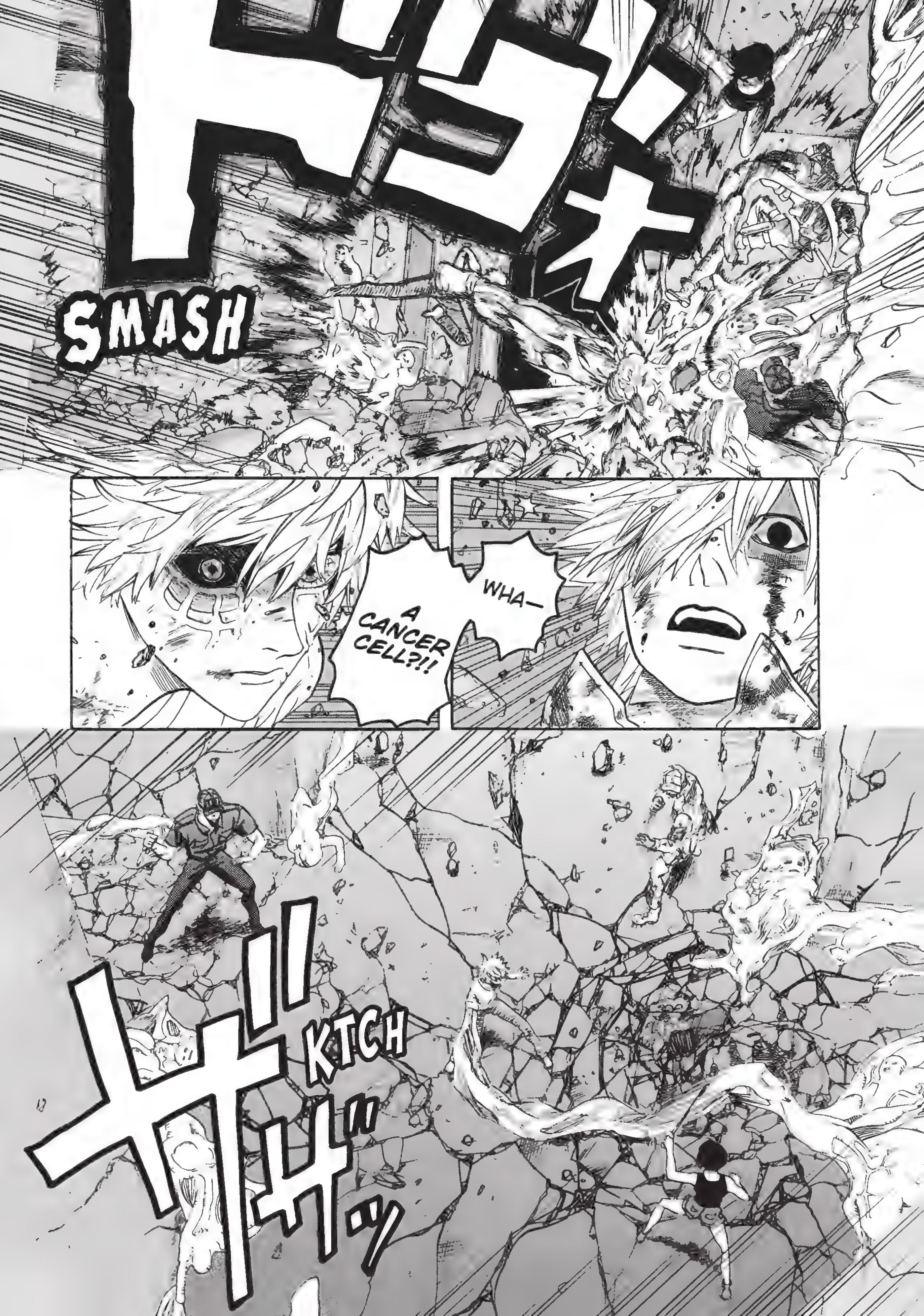
Infiltration
Cancer cells overstep the boundaries of healthy neighboring cells.

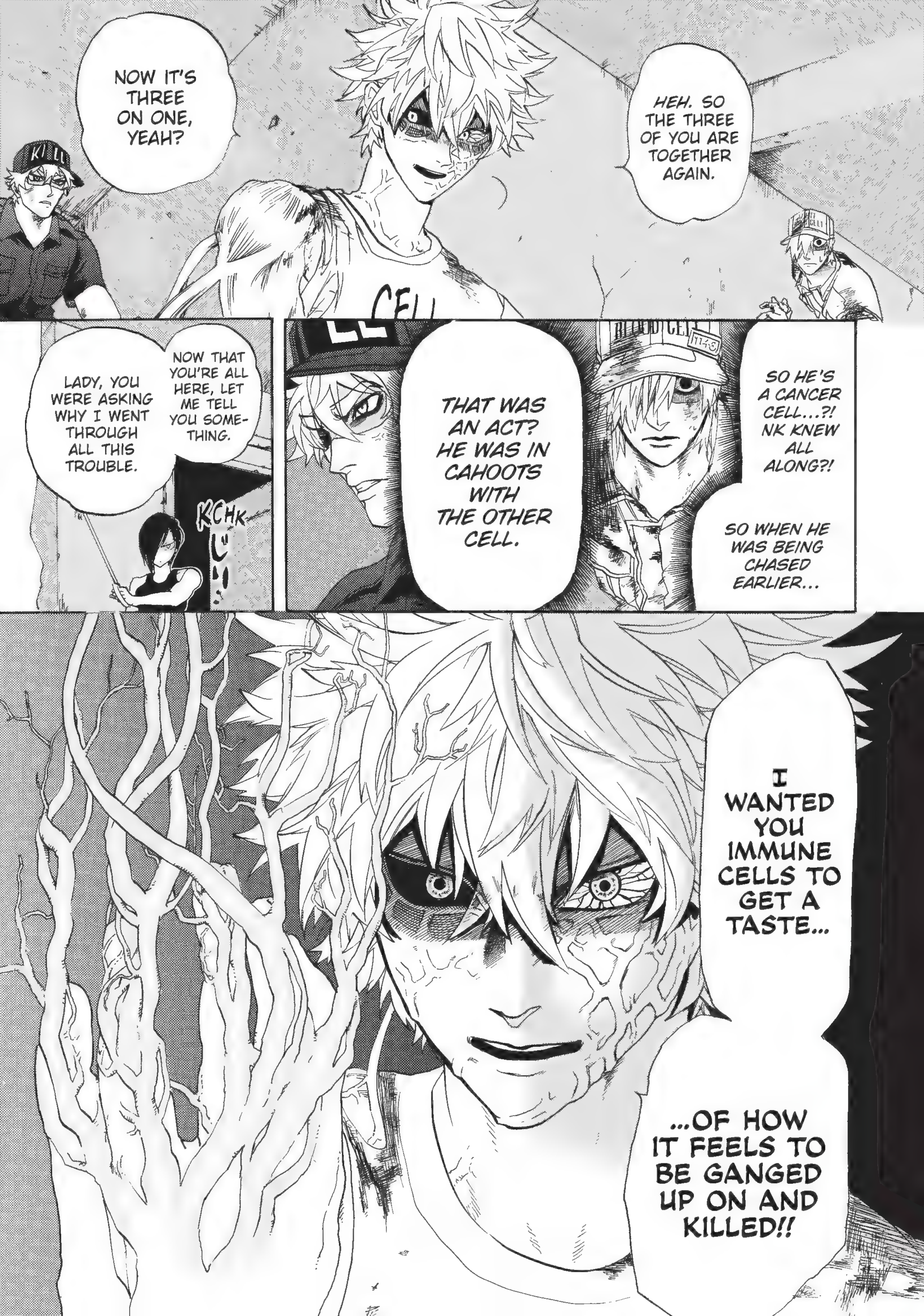

MULTIPLICATION, INFILTRATION, AND METASTASIS!
How to Cell-Divide
THIS IS NO VIRUS!
BOOM
Don't go outside
Stay in
No leaving
Don't leave
Don't go
CELL
CELL
CELL
CELL
CELL
KI
1146
THIS IS CANCER!

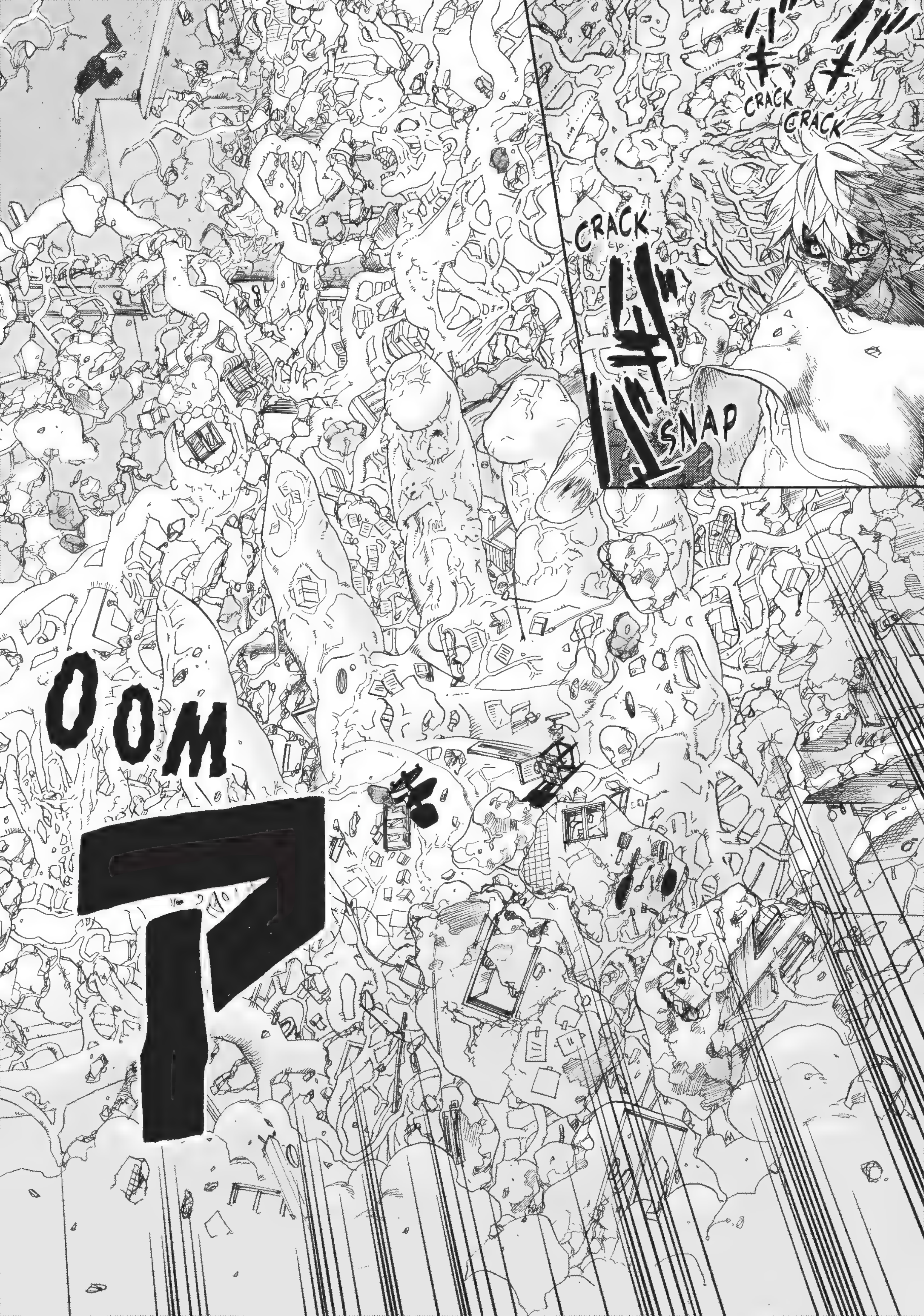

HISSSS!!
GAH!
WHAM
GUH!
THANKS!!
DAMN! WHERE'D THEY COME FROM?!
UGH, THERE'S SO MANY OF THEM...!
GASP! HEY, KILLER! NK AND THAT OTHER CELL ARE IN DANGER!!
YOU MORON!! DON'T WORRY ABOUT HER! THINK ABOUT HOW WE'RE GOING TO GET OUT OF THIS!
RAAAH!
RAAAAH!
WHOOSH
HUH?

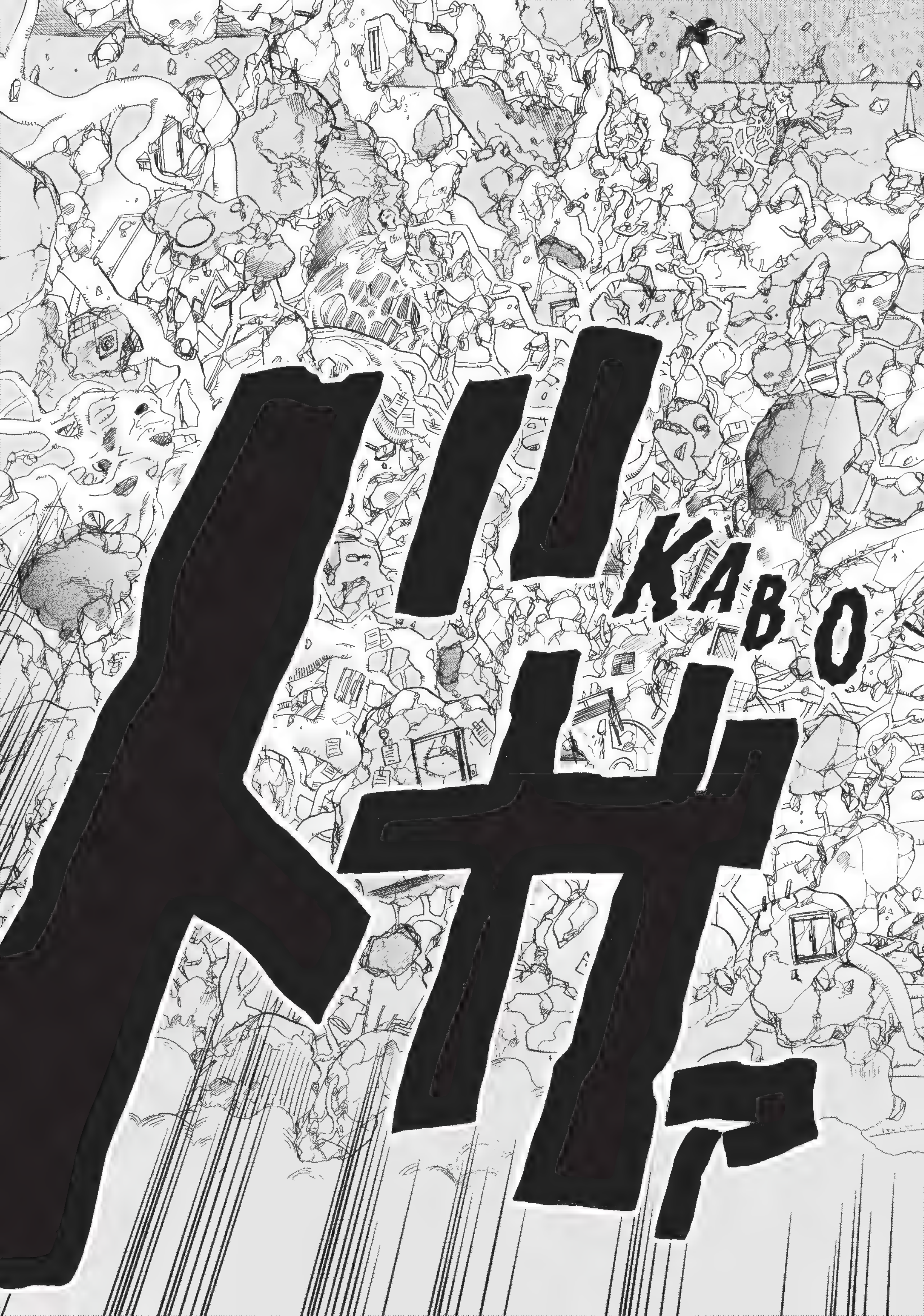

ドムッ
SLAM
WHOA!!!
KILL
WHITE BLOOD CELL
WHA ...?
NK ...?!
PHEW ...
COUGH.
HEY, NK!!
YOU TALKED ALL THAT SMACK, AND THIS IS HOW YOU END UP?!
OH, LIKE YOU TWO ARE LOOKING SO HOT!
STUFF YOUR SOUR GRAPES! I TOLD YOU GOING OFF ON YOUR OWN WAS DUMB!
SHUT YOUR FACE, DUMBASS! YOU TWO BLOCKHEADS COULDN'T EVEN SPOT THAT CANCER CELL TAKING A STROLL IN PUBLIC!
CUT IT OUT, YOU TWO! THIS ISN'T THE TIME OR PLACE!!

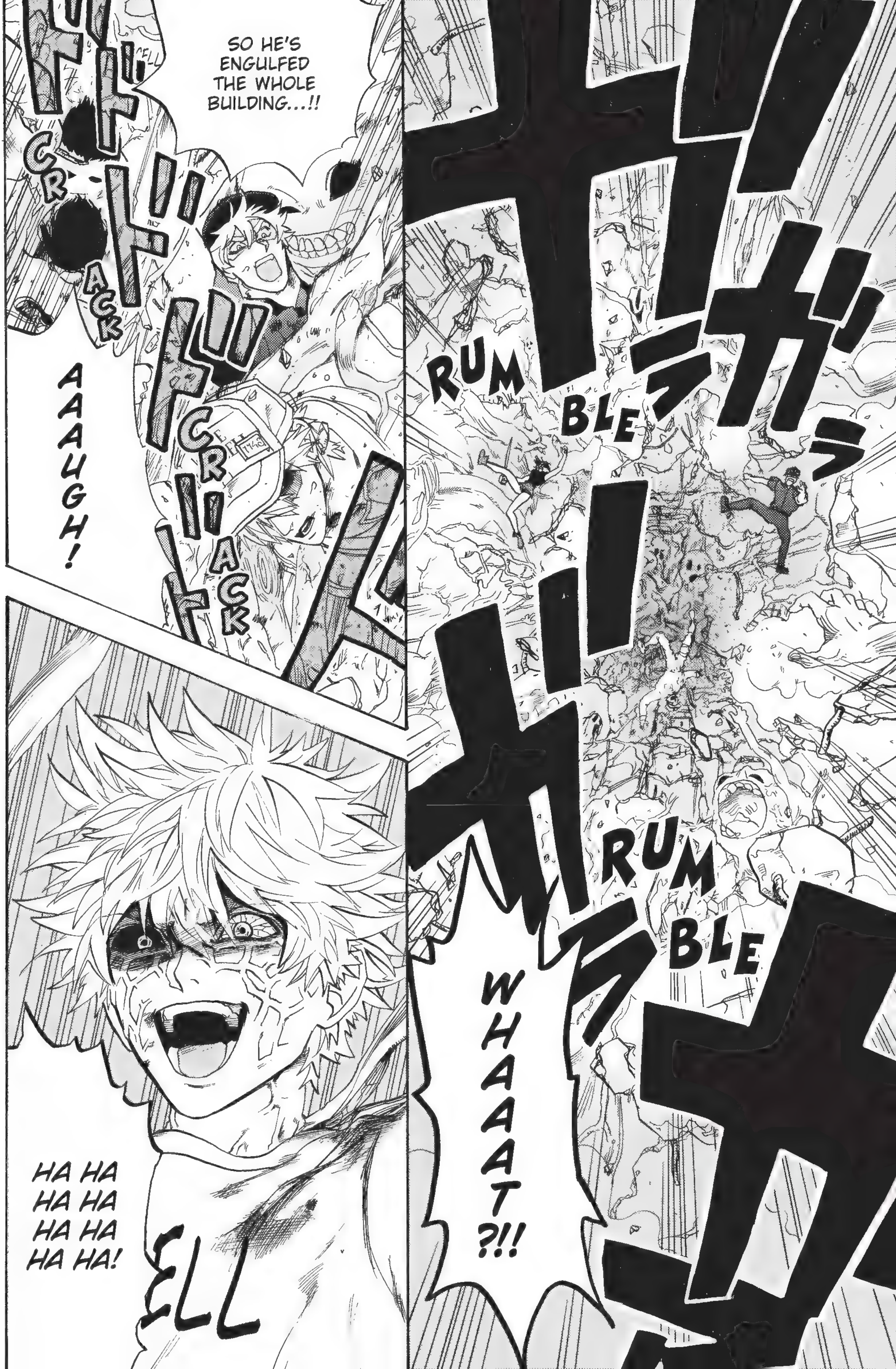

NK! WHAT ABOUT THAT OTHER CELL?!
WHAT HAPPENED TO HIM?!
HOW DENSE ARE YOU?
HE'S RIGHT THERE!
?!
LUNGE

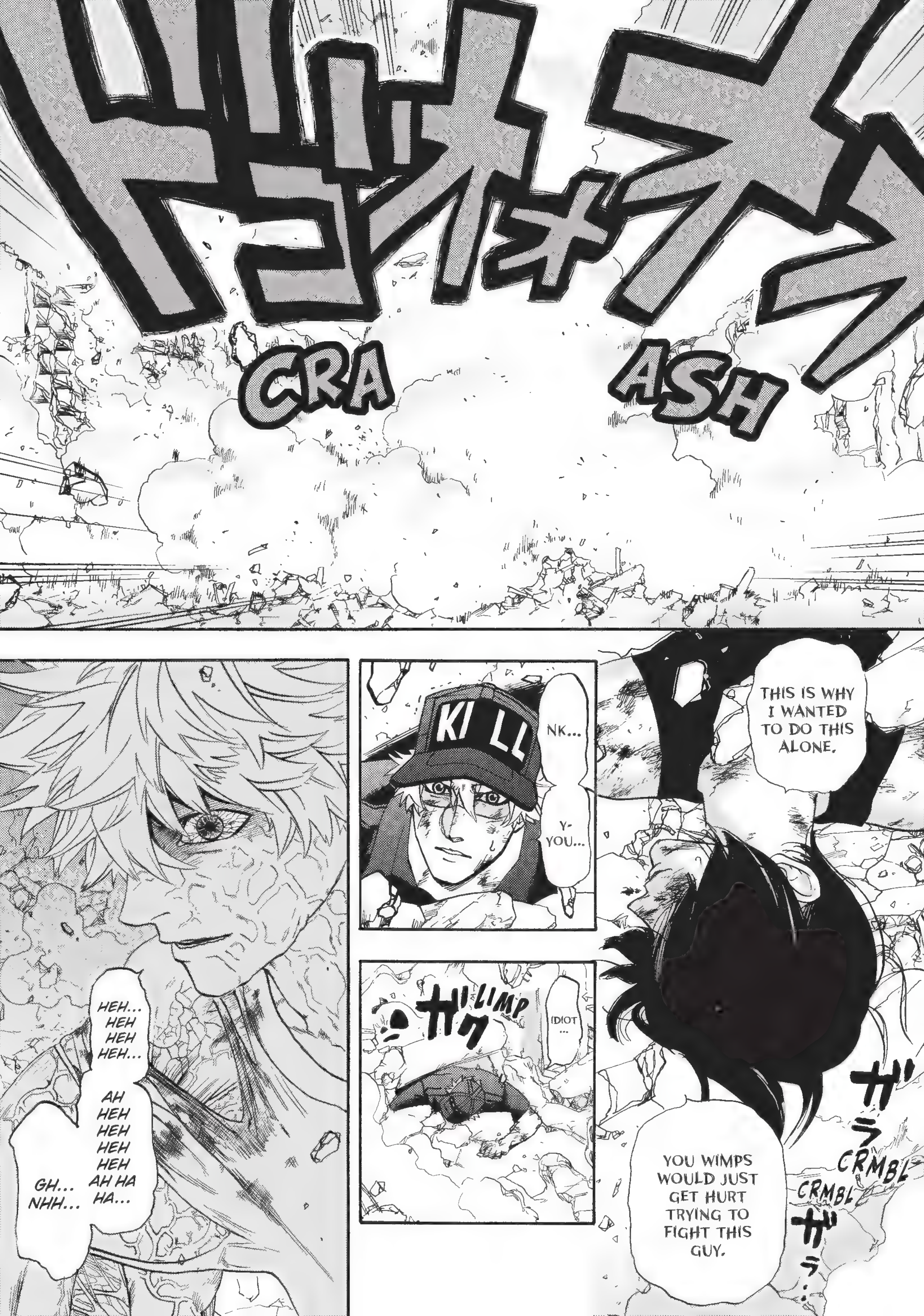

ドゴォ
SMASH
WHA—
A CANCER CELL?!!
ギギッ
KTCH

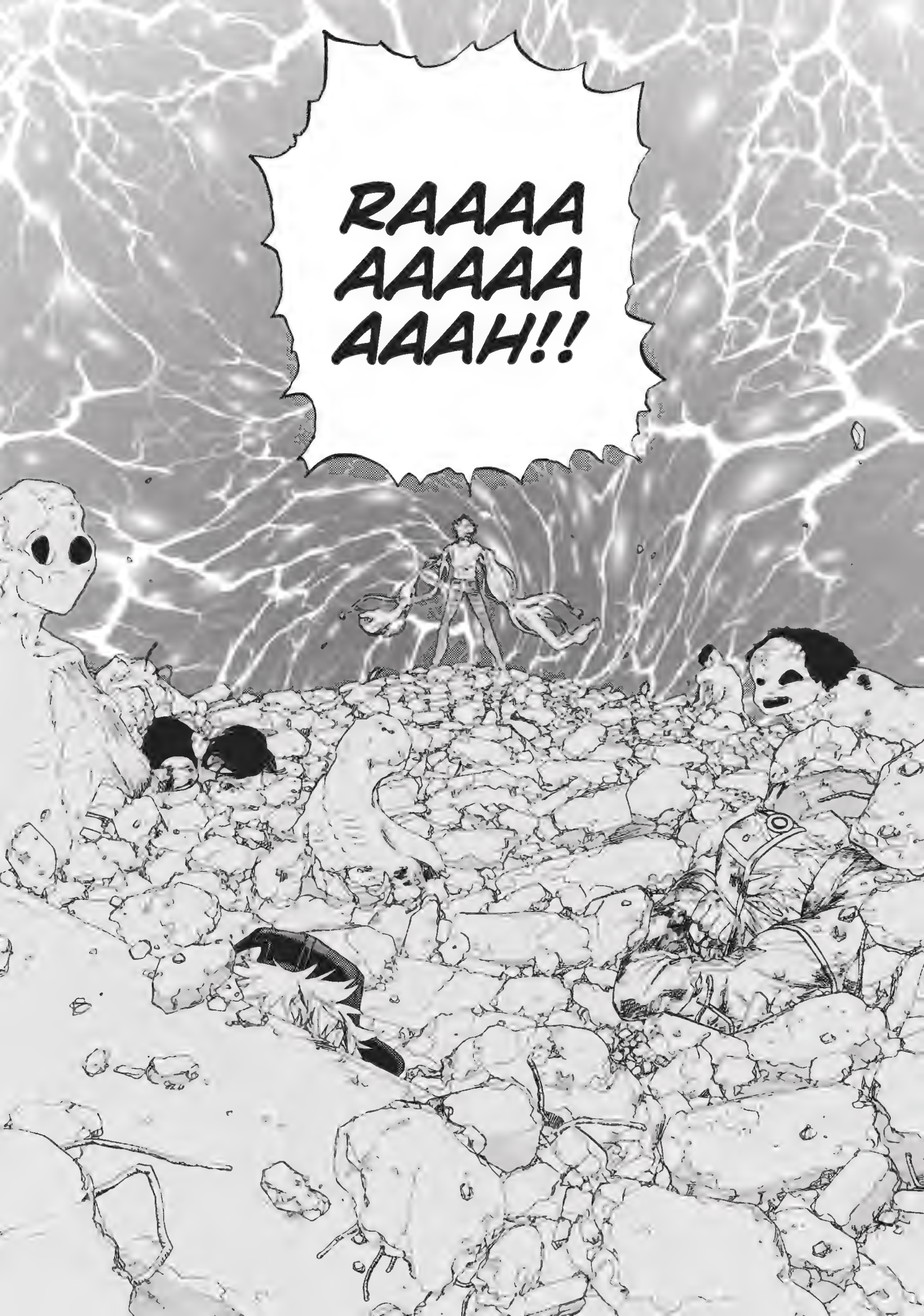

HEH. SO THE THREE OF YOU ARE TOGETHER AGAIN.
NOW IT'S THREE ON ONE, YEAH?
KILL
CELL
SO HE'S A CANCER CELL...?! NK KNEW ALL ALONG?!
SO WHEN HE WAS BEING CHASED EARLIER...
THAT WAS AN ACT? HE WAS IN CAHOOTS WITH THE OTHER CELL.
NOW THAT YOU'RE ALL HERE, LET ME TELL YOU SOMETHING.
LADY, YOU WERE ASKING WHY I WENT THROUGH ALL THIS TROUBLE.
KCHK
I WANTED YOU IMMUNE CELLS TO GET A TASTE...
...OF HOW IT FEELS TO BE GANGED UP ON AND KILLED!!

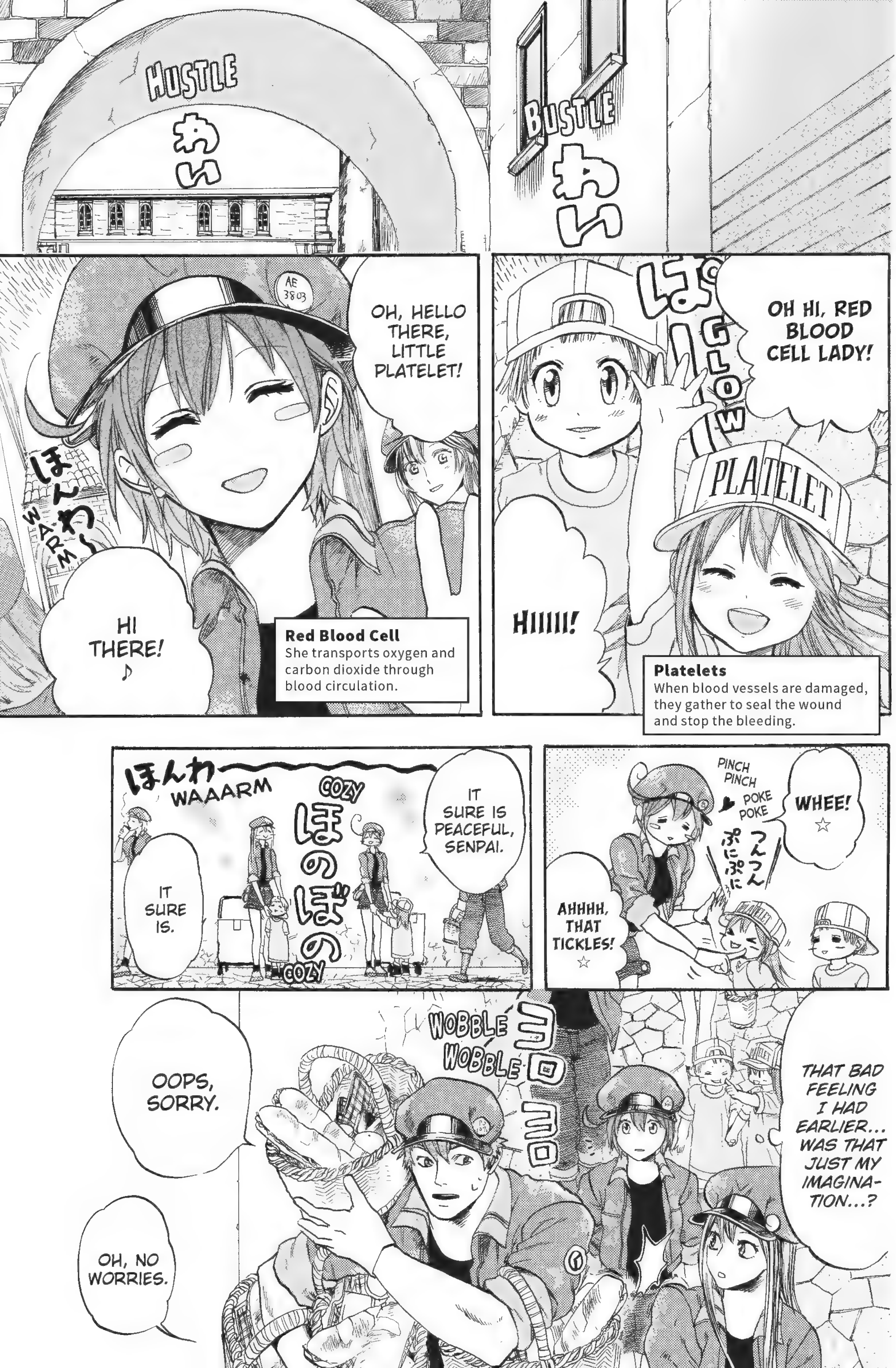

バキ
CRACK
CRACK
CRACK
SNAP
OOM


ドザァ
KABO


RUMBLE
RUMBLE
WHAAAAT?!!
SO HE'S ENGULFED THE WHOLE BUILDING...!!
CRACK
CRIIACK
AAAAUGH!
HA HA HA HA HA HA HA HA!

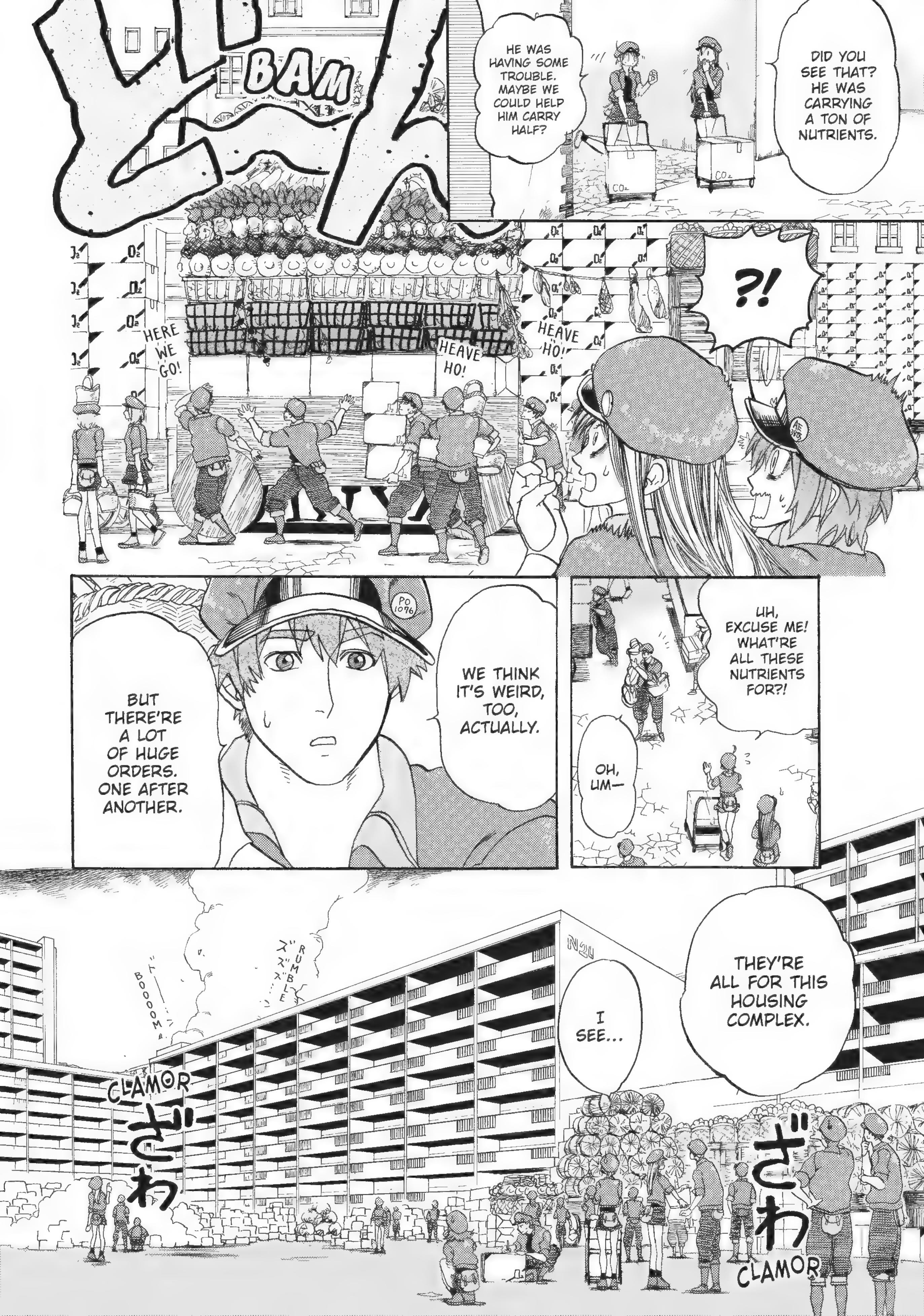

ドゴォオン
CRA
ASH
THIS IS WHY I WANTED TO DO THIS ALONE.
NK...
Y-YOU...
KILL
YOU WIMPS WOULD JUST GET HURT TRYING TO FIGHT THIS GUY.
ガラ
CRMBL
CRMBL
ガラ...
IDIOT...
ガク
LIMP
HEH... HEH HEH HEH...
AH HEH HEH HEH HEH AH HA HA...
GH... NHH...


RAAAA
AAAAA
AAAH!!

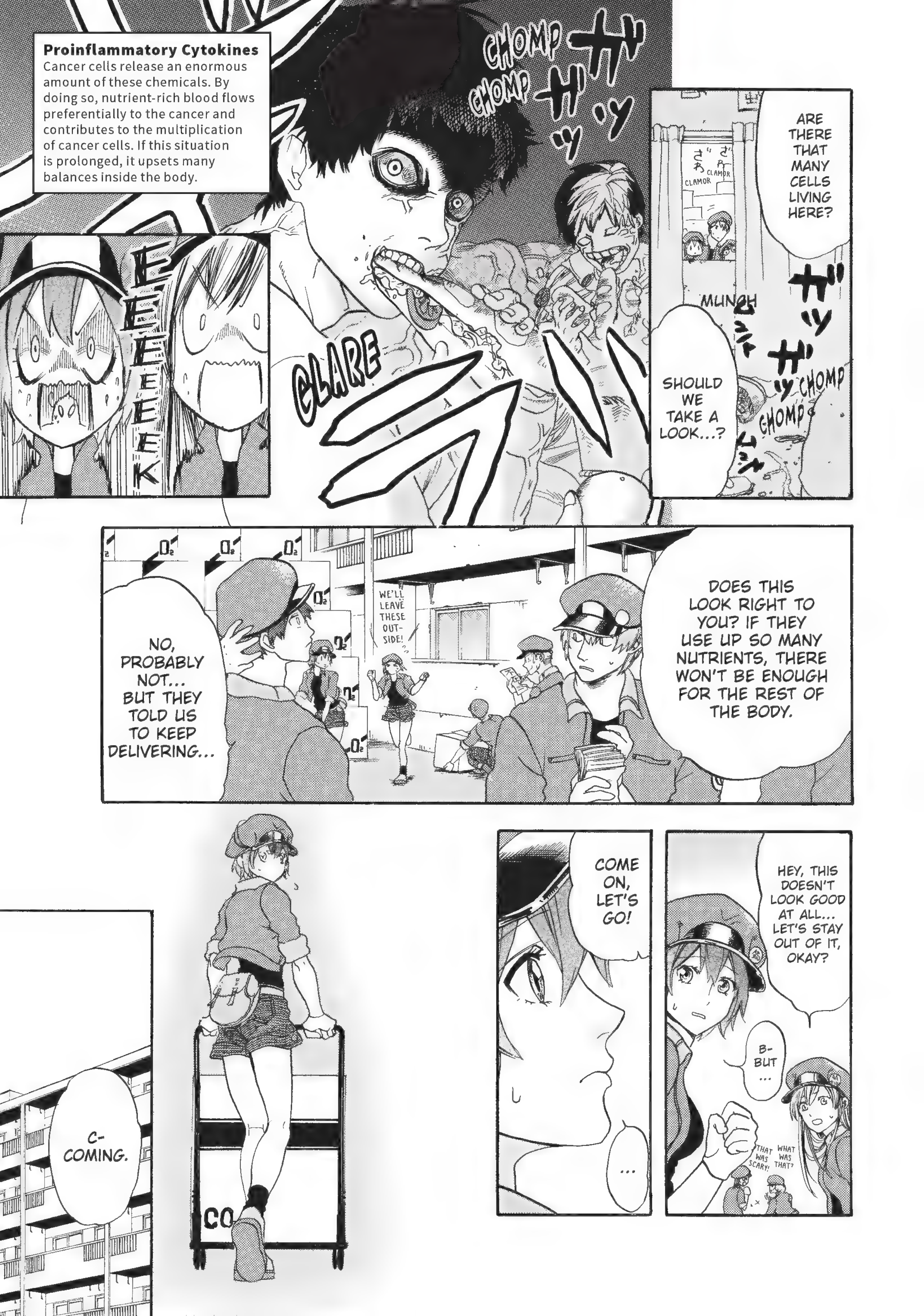

HUSTLE
わい
BUSTLE
わい
ぱっ
GLOW
OH HI, RED BLOOD CELL LADY!
HIIIII!
PLATELET
OH, HELLO THERE, LITTLE PLATELET!
AE 3803
ほんわ～
WARM
HI THERE! ♪
WHEE! ☆
PINCH PINCH
POKE POKE
つんつん
ぷにぷに
AHHHH, THAT TICKLES! ☆
IT SURE IS PEACEFUL, SENPAI.
ほんわ～
WAAARM
ほのぼの
COZY COZY
IT SURE IS.
THAT BAD FEELING I HAD EARLIER... WAS THAT JUST MY IMAGINATION...?
ヨロヨロ
WOBBLE WOBBLE
OOPS, SORRY.
OH, NO WORRIES.

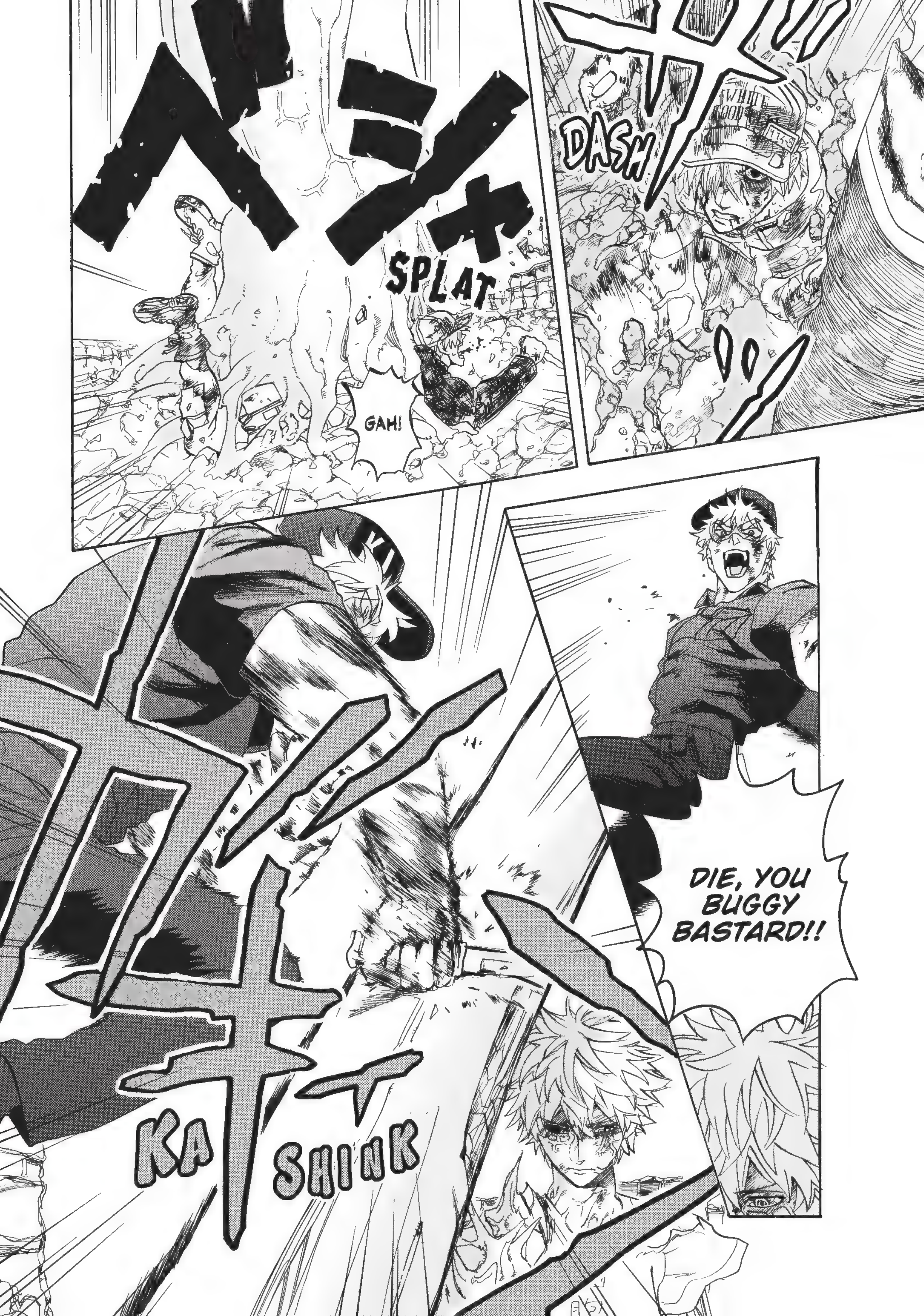
Red Blood Cell
She transports oxygen and carbon dioxide through blood circulation.

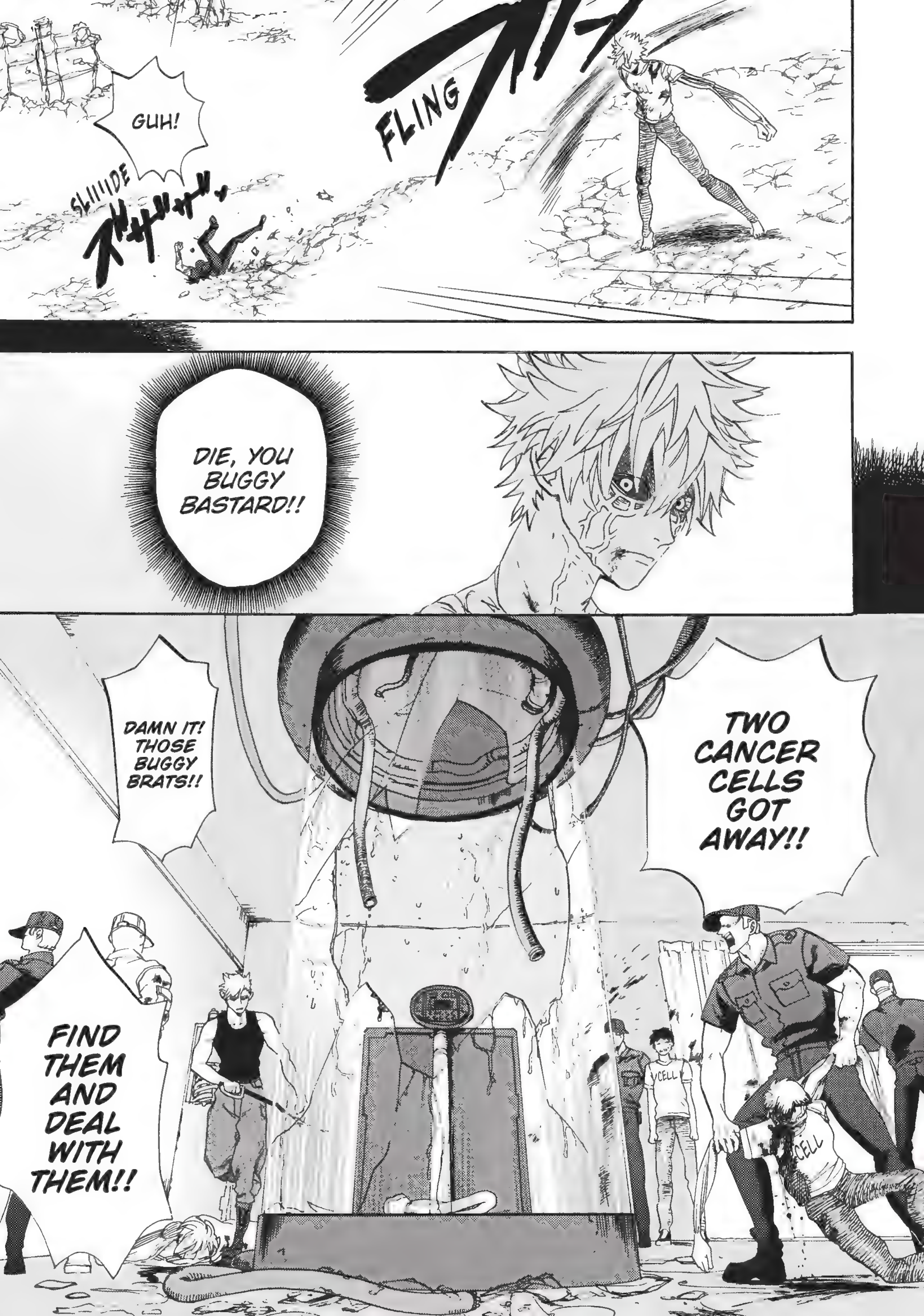
Platelets
When blood vessels are damaged, they gather to seal the wound and stop the bleeding.

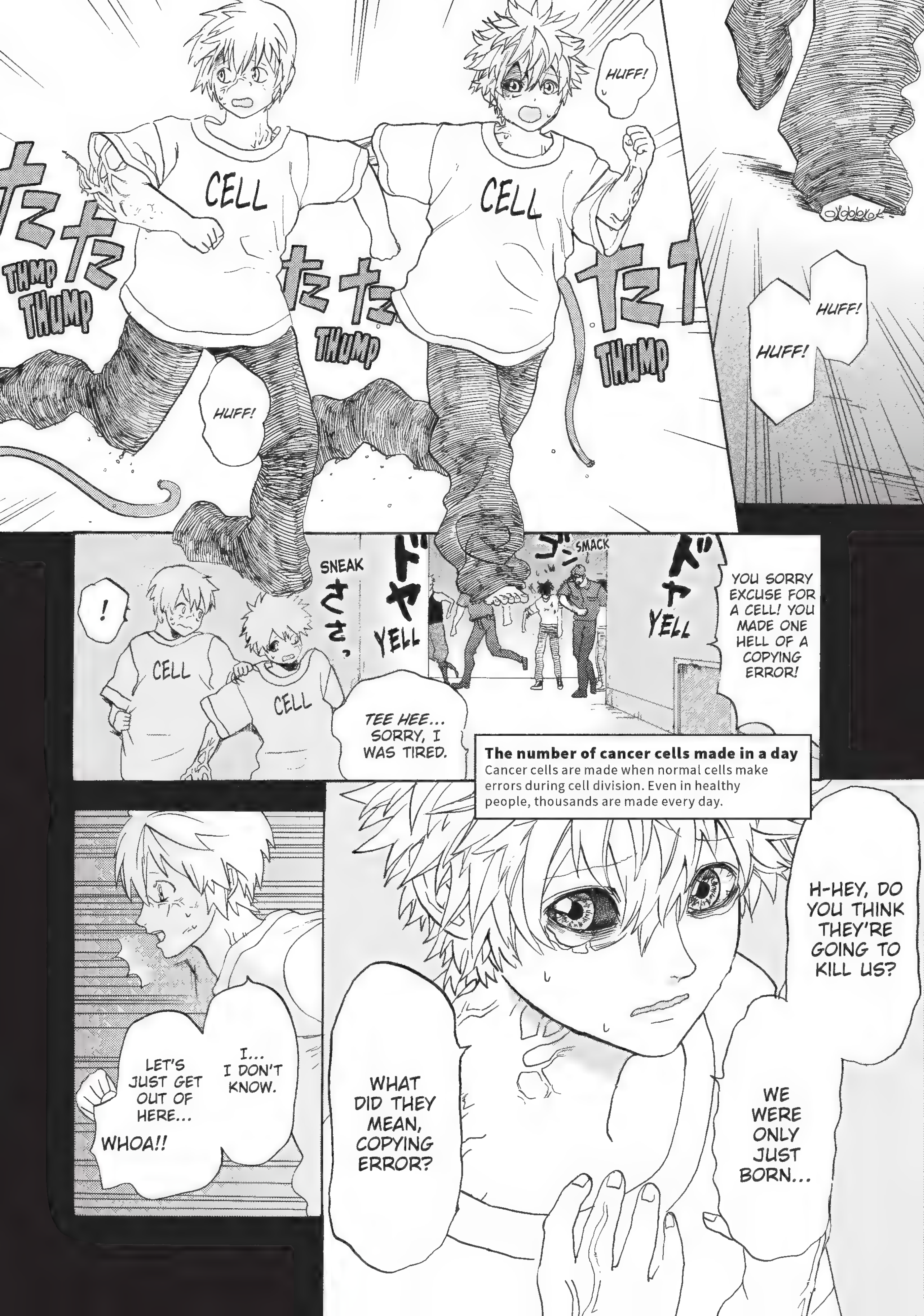

DID YOU SEE THAT? HE WAS CARRYING A TON OF NUTRIENTS.
HE WAS HAVING SOME TROUBLE. MAYBE WE COULD HELP HIM CARRY HALF?
CO2
CO2
BAM
?!
AE 3803
HEAVE HO!
HEAVE HO!
HERE WE GO!
O2
UH, EXCUSE ME! WHAT'RE ALL THESE NUTRIENTS FOR?!
OH, UM—
WE THINK IT'S WEIRD, TOO, ACTUALLY.
PO 1076
BUT THERE'RE A LOT OF HUGE ORDERS. ONE AFTER ANOTHER.
THEY'RE ALL FOR THIS HOUSING COMPLEX.
I SEE...
N21
ズズ… RUMBLE
ド—— BOOOOOM
ざわ CLAMOR
ざわ CLAMOR

Proinflammatory Cytokines
Cancer cells release an enormous amount of these chemicals. By doing so, nutrient-rich blood flows preferentially to the cancer and contributes to the multiplication of cancer cells. If this situation is prolonged, it upsets many balances inside the body.


CLAMOR
CLAMOR
ARE THERE THAT MANY CELLS LIVING HERE?
SHOULD WE TAKE A LOOK...?
MUNCH
CHOMP
CHOMP
CHOMP
CHOMP
GLARE
EEEEEEEEK
DOES THIS LOOK RIGHT TO YOU? IF THEY USE UP SO MANY NUTRIENTS, THERE WON'T BE ENOUGH FOR THE REST OF THE BODY.
WE'LL LEAVE THESE OUT-SIDE!
NO, PROBABLY NOT... BUT THEY TOLD US TO KEEP DELIVERING...
HEY, THIS DOESN'T LOOK GOOD AT ALL... LET'S STAY OUT OF IT, OKAY?
B-BUT...
WHAT WAS THAT?
THAT WAS SCARY!
COME ON, LET'S GO!
...
C-COMING.
CO

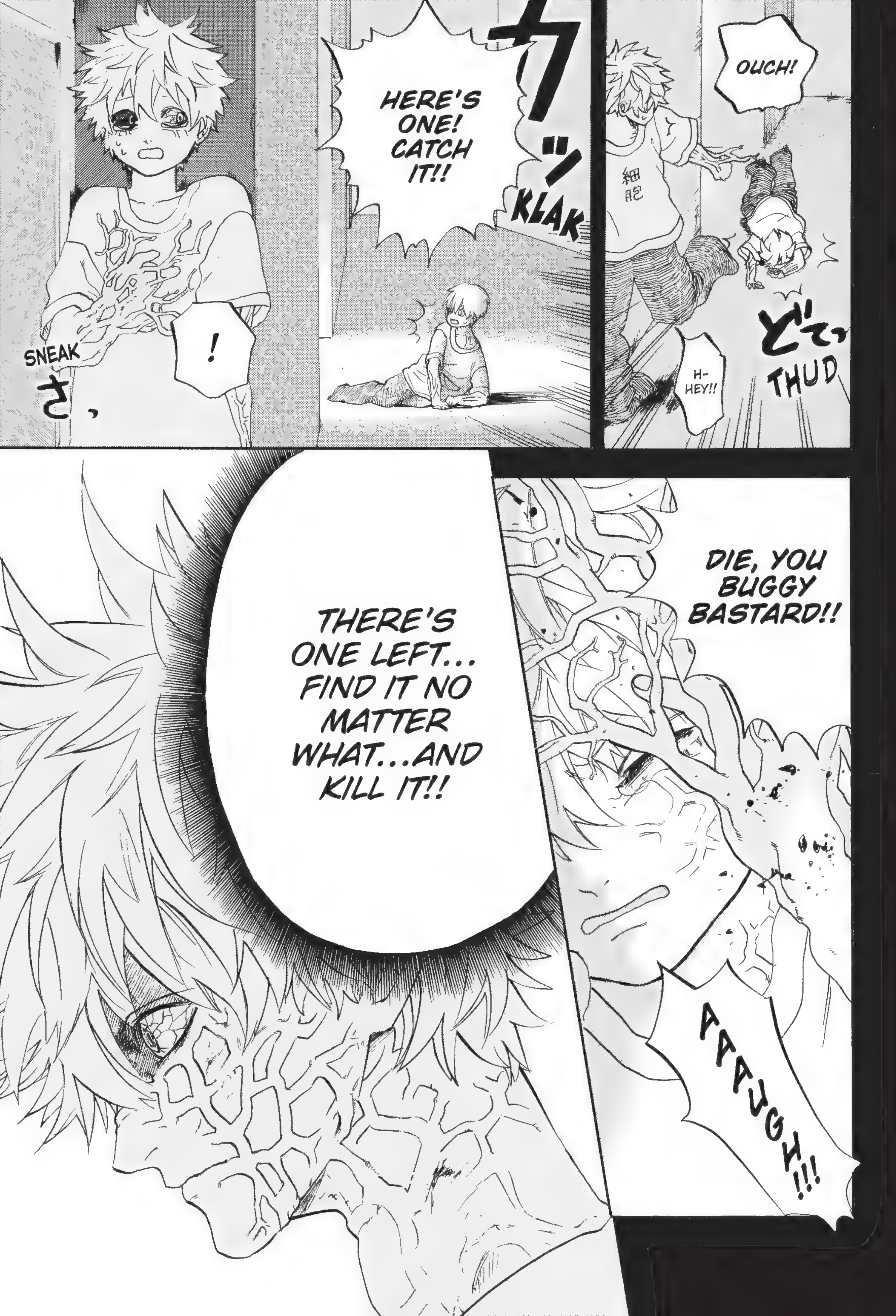

DASH
WHITE BLOOD
1146
ベシャ
SPLAT
GAH!
DIE, YOU BUGGY BASTARD!!
KA SHINK

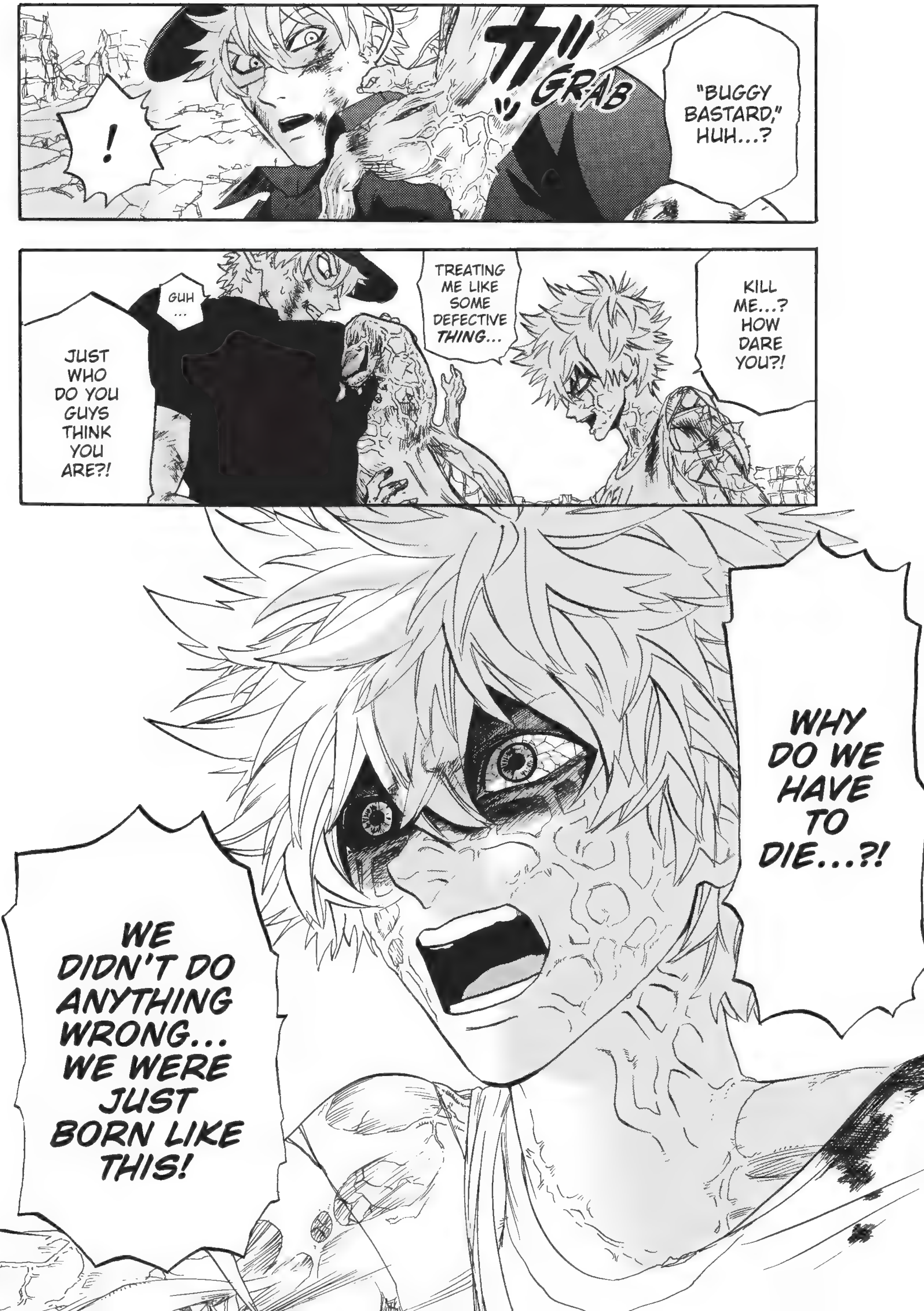

FLING
GUH!
SLIIIIDE
DIE, YOU BUGGY BASTARD!!
TWO CANCER CELLS GOT AWAY!!
DAMN IT! THOSE BUGGY BRATS!!
FIND THEM AND DEAL WITH THEM!!
CELL
CELL

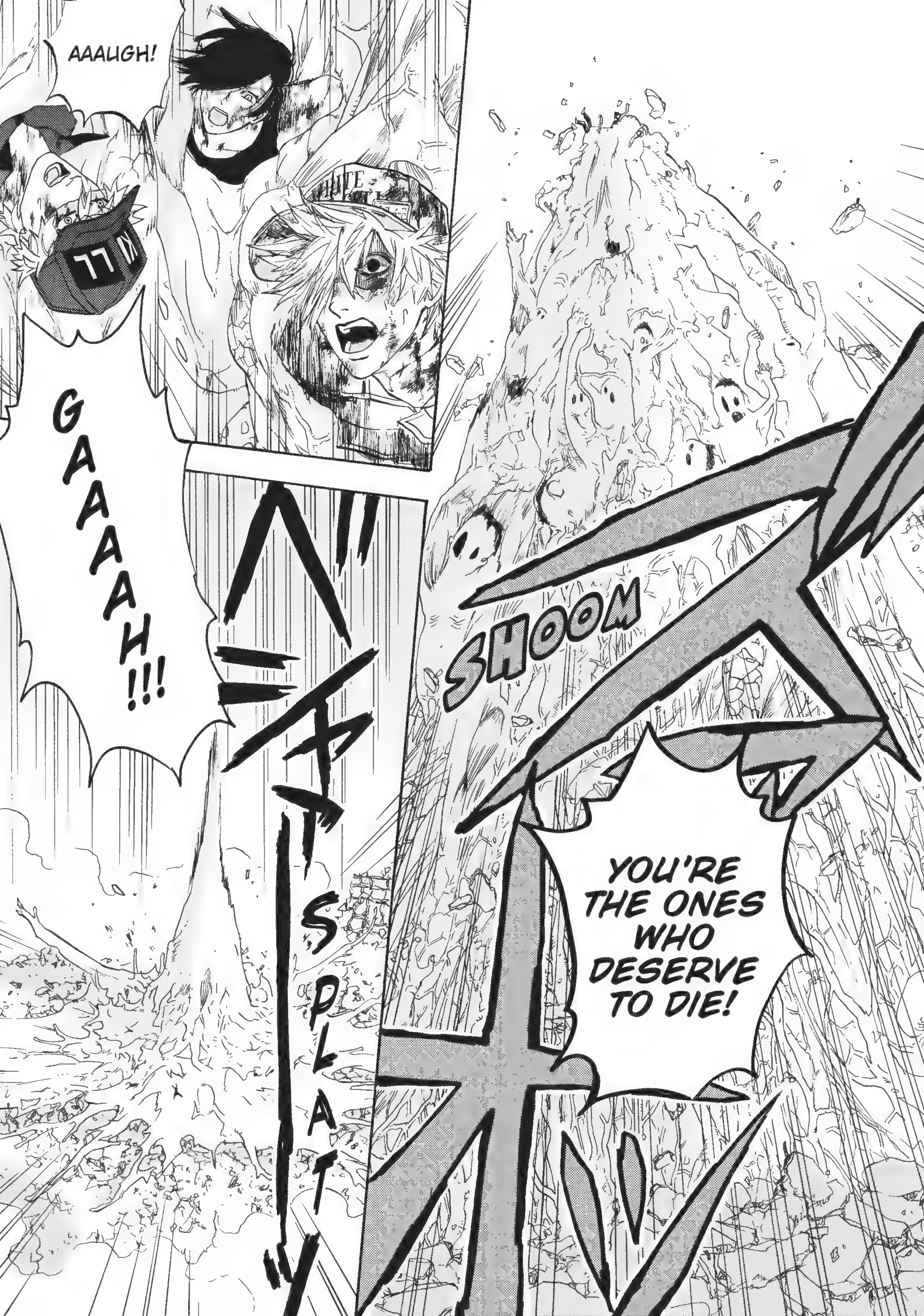

HUFF!
HUFF!
HUFF!
たっ
THUMP
たた
THUMP
たた
THUMP
THUMP
CELL
CELL
HUFF!
YOU SORRY EXCUSE FOR A CELL! YOU MADE ONE HELL OF A COPYING ERROR!
ズヤ
YELL
ゴン
SMACK
ドヤ
YELL
ささ
SNEAK
!
TEE HEE... SORRY, I WAS TIRED.
CELL
CELL
H-HEY, DO YOU THINK THEY'RE GOING TO KILL US?
WE WERE ONLY JUST BORN...
WHAT DID THEY MEAN, COPYING ERROR?
I... I DON'T KNOW.
LET'S JUST GET OUT OF HERE...
WHOA!!

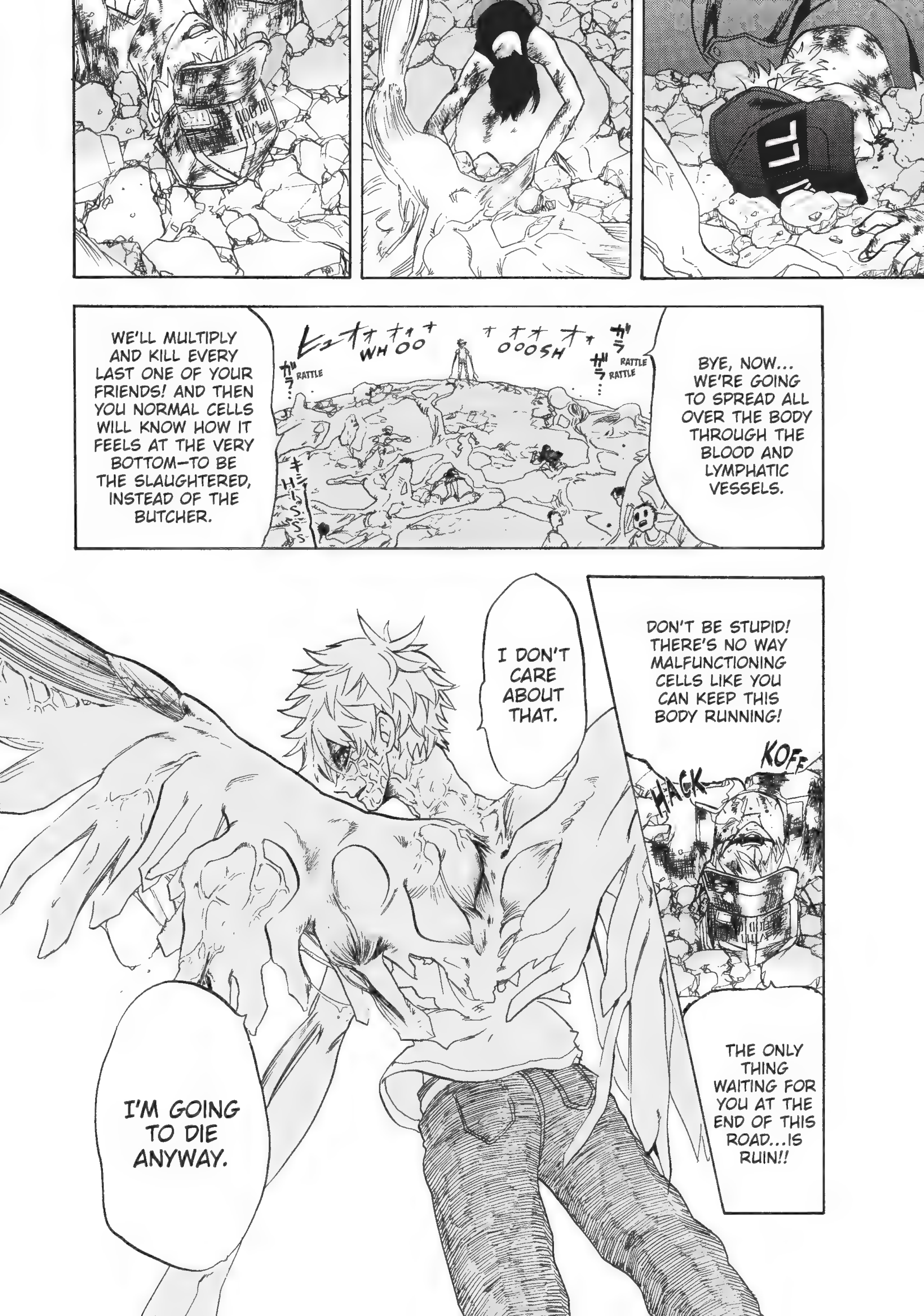
The number of cancer cells made in a day

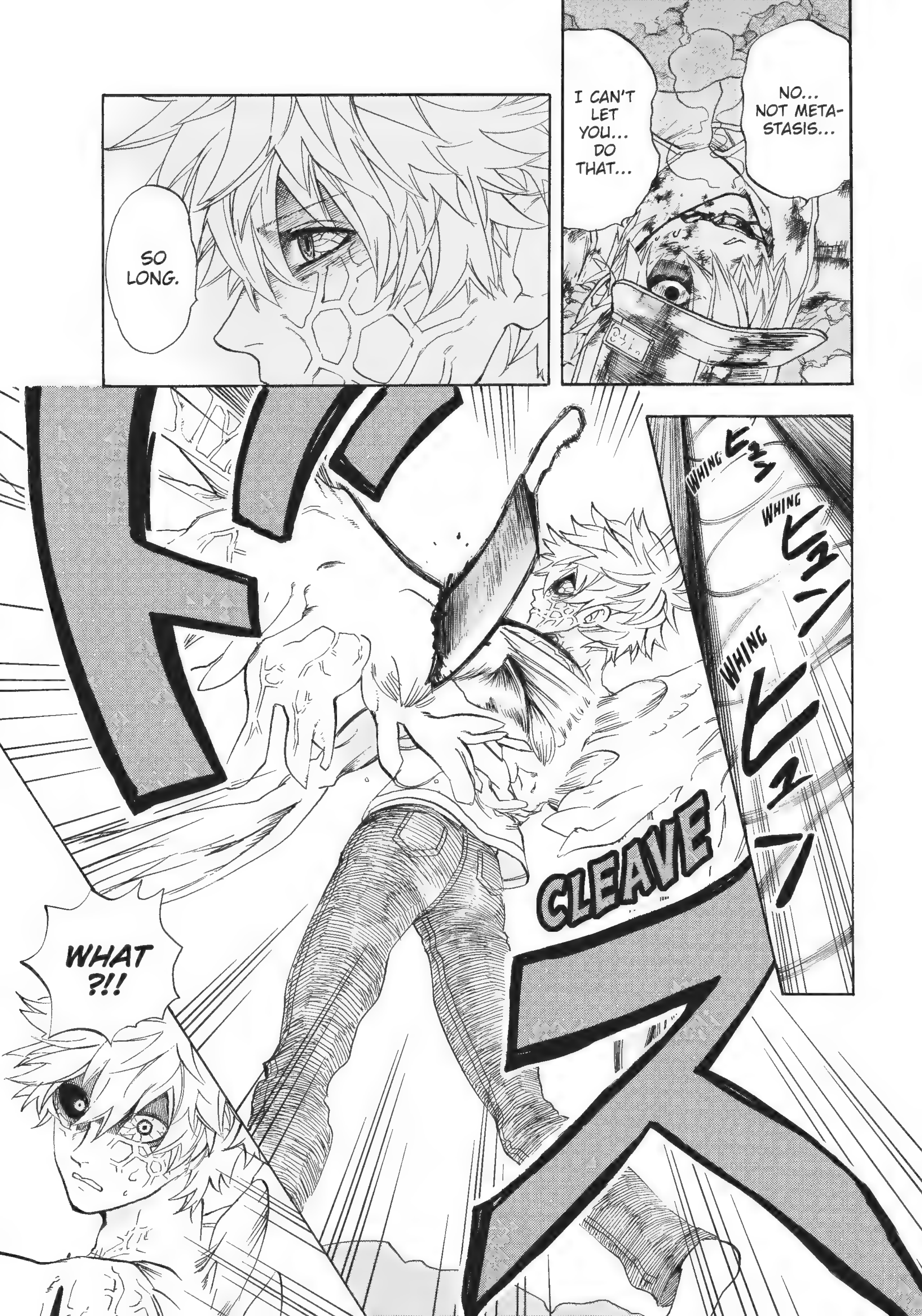
Cancer cells are made when normal cells make errors during cell division. Even in healthy people, thousands are made every day.

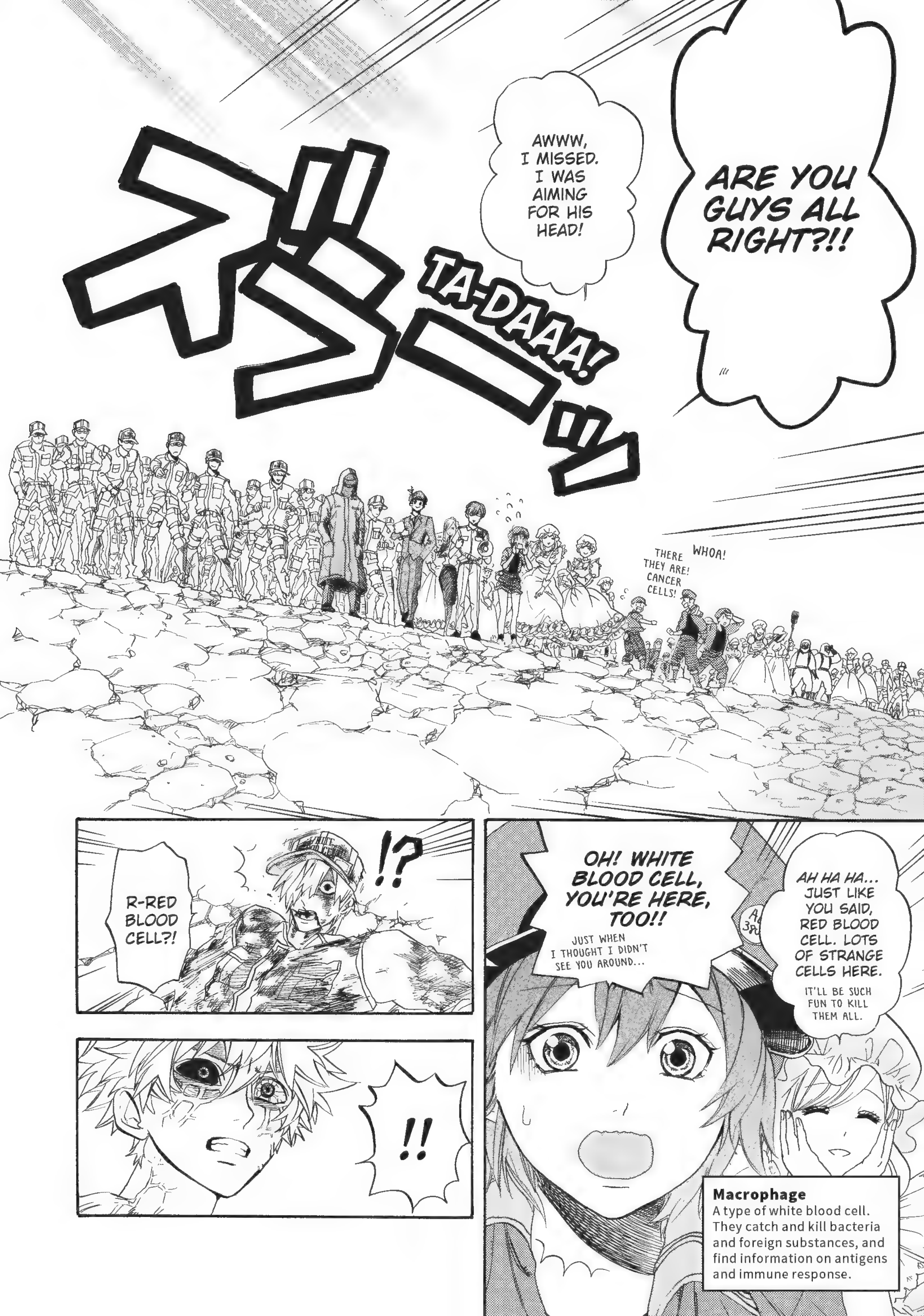

OUCH!
細胞
H-HEY!!
どてっ
THUD
HERE'S ONE! CATCH IT!!
カッ
KLAK
!
さっ
SNEAK
DIE, YOU BUGGY BASTARD!!
AAAUGH!!!
THERE'S ONE LEFT... FIND IT NO MATTER WHAT...AND KILL IT!!


"BUGGY BASTARD," HUH...?
ガッ GRAB
!
KILL ME...? HOW DARE YOU?!
TREATING ME LIKE SOME DEFECTIVE *THING*...
GUH...
JUST WHO DO YOU GUYS THINK YOU ARE?!
WHY DO WE HAVE TO DIE...?!
WE DIDN'T DO ANYTHING WRONG... WE WERE JUST BORN LIKE THIS!

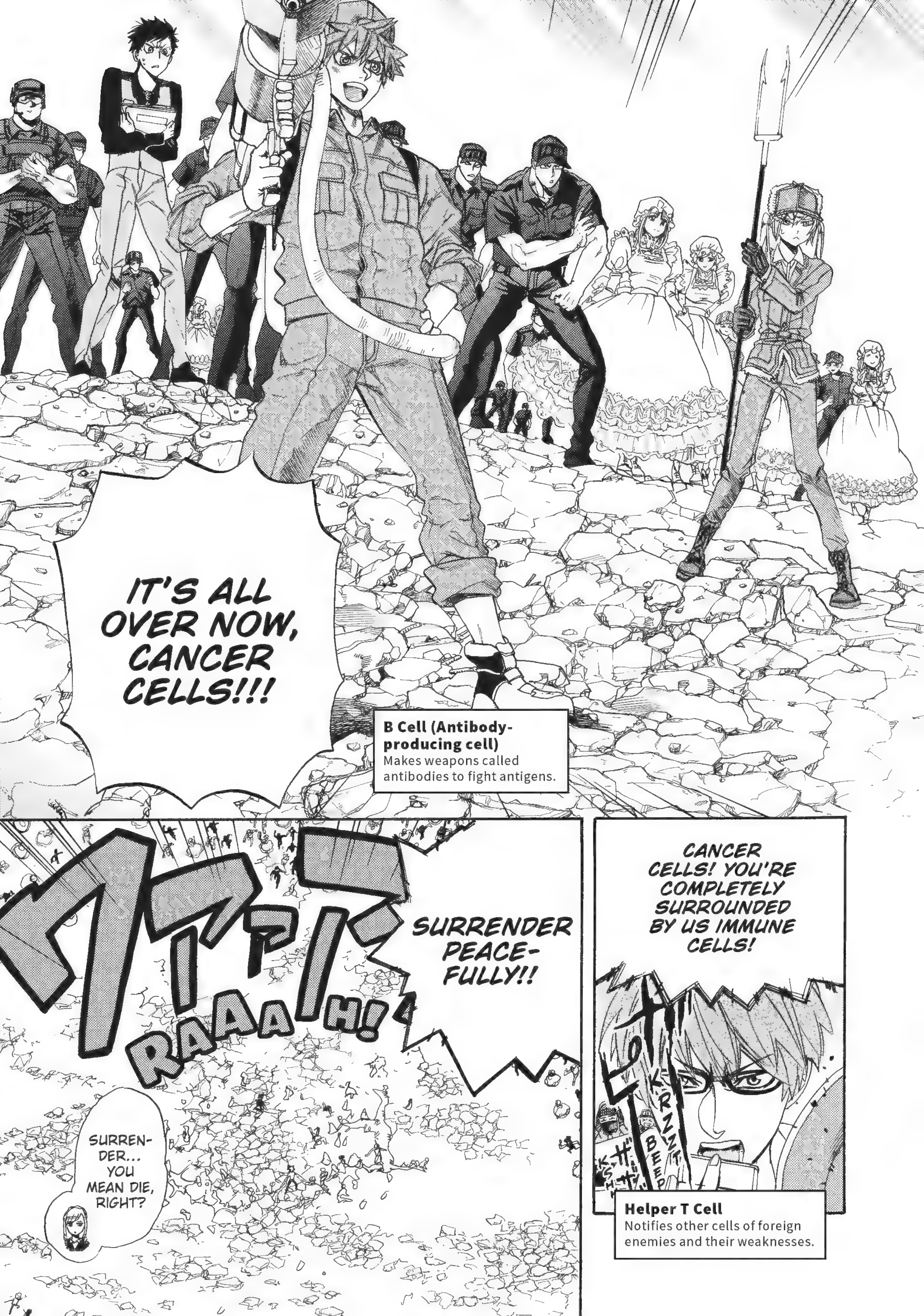

SHOOM
YOU'RE THE ONES WHO DESERVE TO DIE!
AAAUGH!
GAAAAAH!!!
SPLAT


BYE, NOW... WE'RE GOING TO SPREAD ALL OVER THE BODY THROUGH THE BLOOD AND LYMPHATIC VESSELS.
ガラ RATTLE
ガラ RATTLE
ヒュオオオオ WHOO
オオオオオ OOOSH
ガラ RATTLE
キシ HISSS
WE'LL MULTIPLY AND KILL EVERY LAST ONE OF YOUR FRIENDS! AND THEN YOU NORMAL CELLS WILL KNOW HOW IT FEELS AT THE VERY BOTTOM—TO BE THE SLAUGHTERED, INSTEAD OF THE BUTCHER.
DON'T BE STUPID! THERE'S NO WAY MALFUNCTIONING CELLS LIKE YOU CAN KEEP THIS BODY RUNNING!
KOFF
HACK
I DON'T CARE ABOUT THAT.
THE ONLY THING WAITING FOR YOU AT THE END OF THIS ROAD...IS RUIN!!
I'M GOING TO DIE ANYWAY.


NO... NOT META-STASIS...
I CAN'T LET YOU... DO THAT...
SO LONG.
WHING
WHING
WHING
CLEAVE
WHAT ?!!

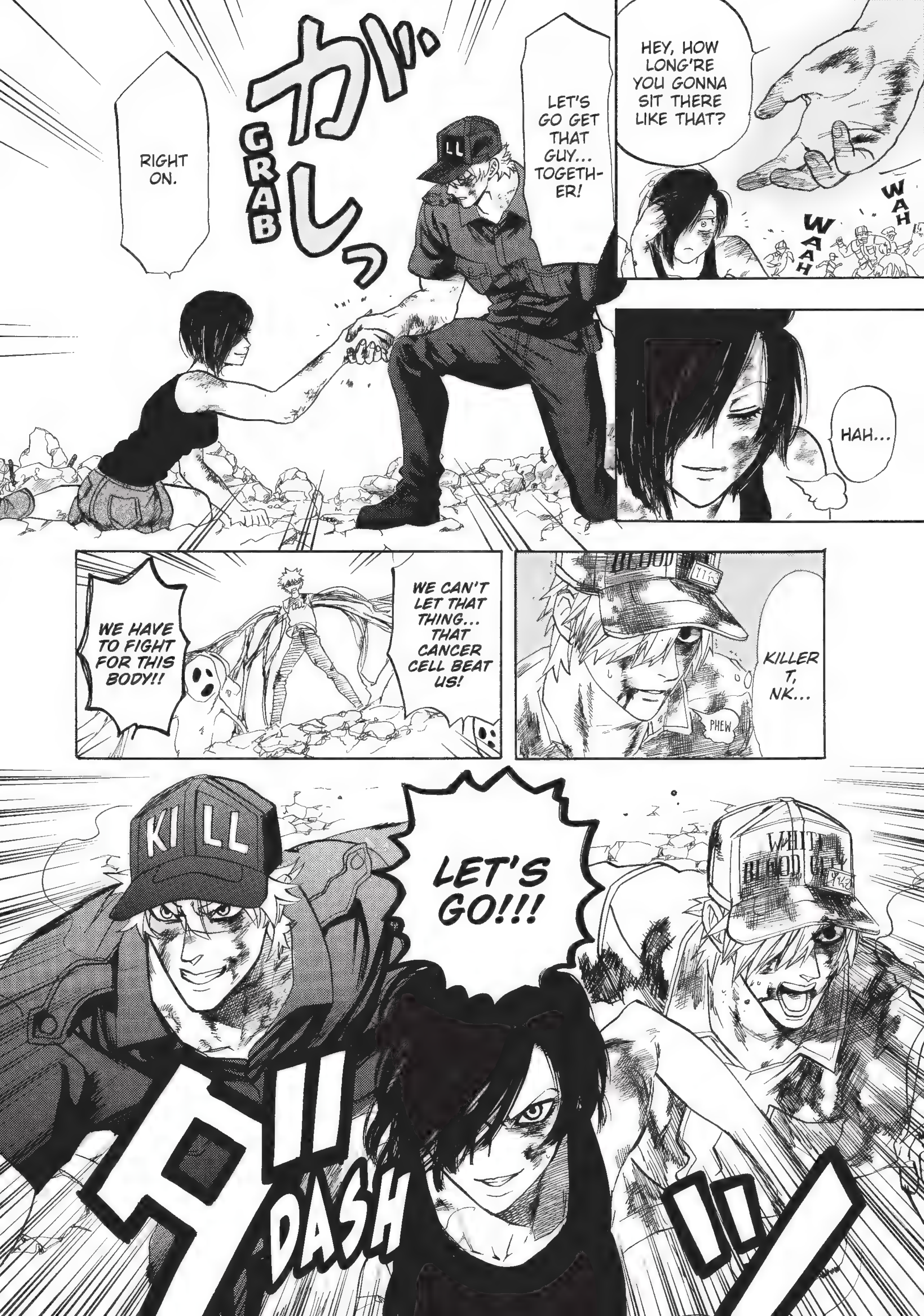

ARE YOU GUYS ALL RIGHT?!!
AWWW, I MISSED. I WAS AIMING FOR HIS HEAD!
TA-DAAA!
WHOA!
THERE THEY ARE! CANCER CELLS!
AH HA HA... JUST LIKE YOU SAID, RED BLOOD CELL. LOTS OF STRANGE CELLS HERE.
IT'LL BE SUCH FUN TO KILL THEM ALL.
OH! WHITE BLOOD CELL, YOU'RE HERE, TOO!!
JUST WHEN I THOUGHT I DIDN'T SEE YOU AROUND...
!?
R-RED BLOOD CELL?!
!!

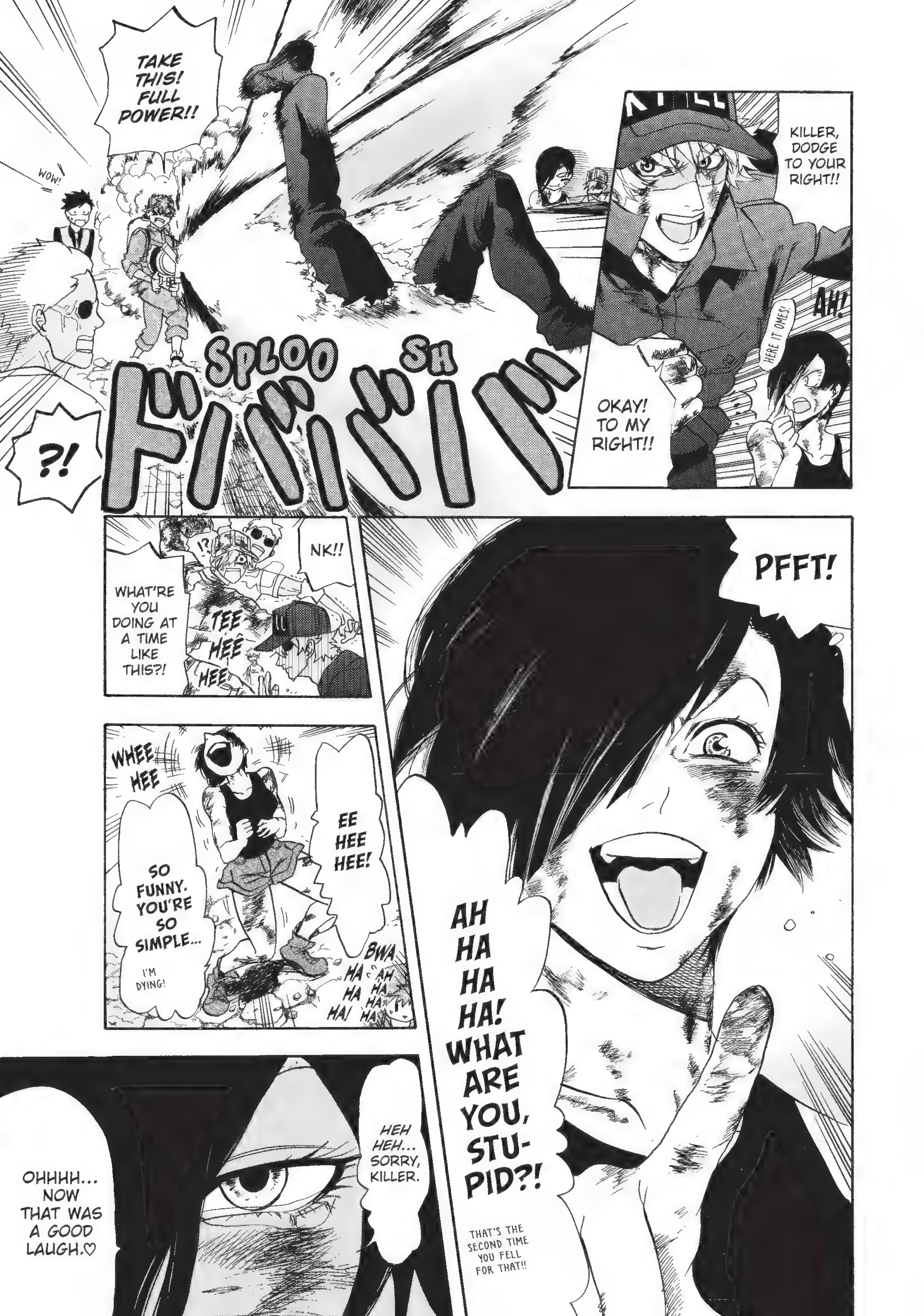
Macrophage
A type of white blood cell. They catch and kill bacteria and foreign substances, and find information on antigens and immune response.

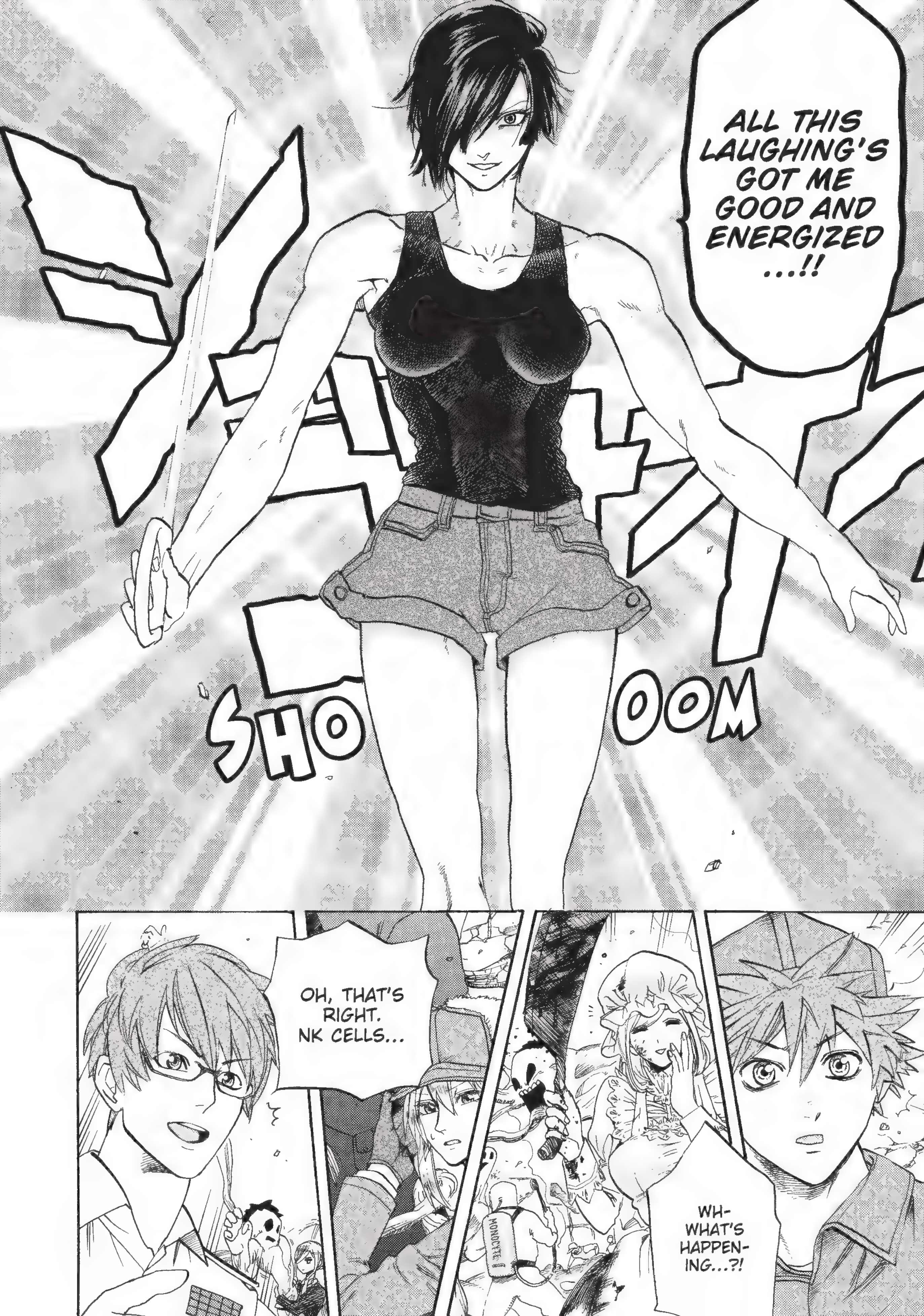

IT'S ALL OVER NOW, CANCER CELLS!!!
CANCER CELLS! YOU'RE COMPLETELY SURROUNDED BY US IMMUNE CELLS!
KRZZT
BEEP
KSHH
SURRENDER PEACEFULLY!!
RAAAAH!
SURRENDER... YOU MEAN DIE, RIGHT?

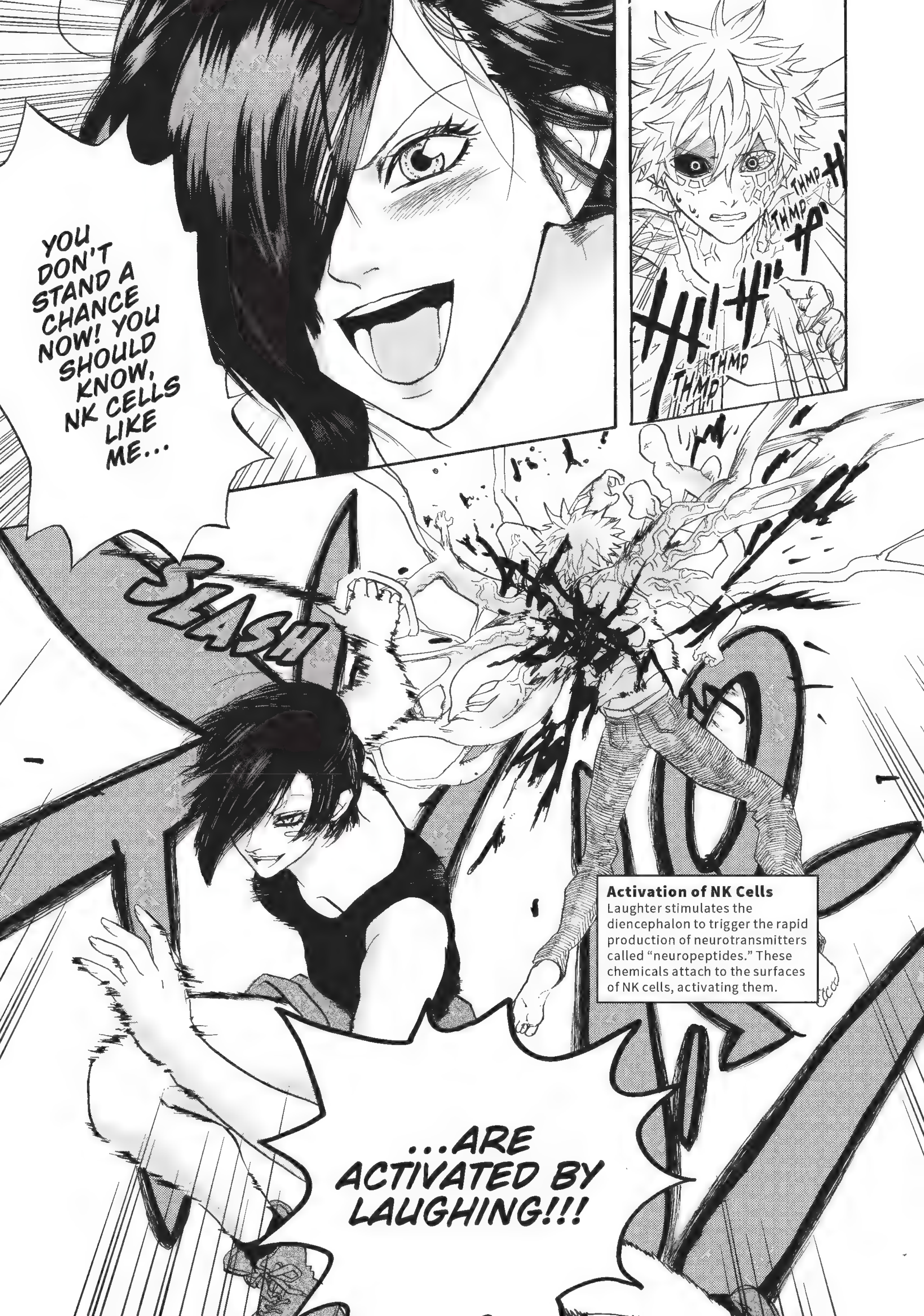
B Cell (Antibody-producing cell)
Makes weapons called antibodies to fight antigens.

Helper T Cell
Notifies other cells of foreign enemies and their weaknesses.

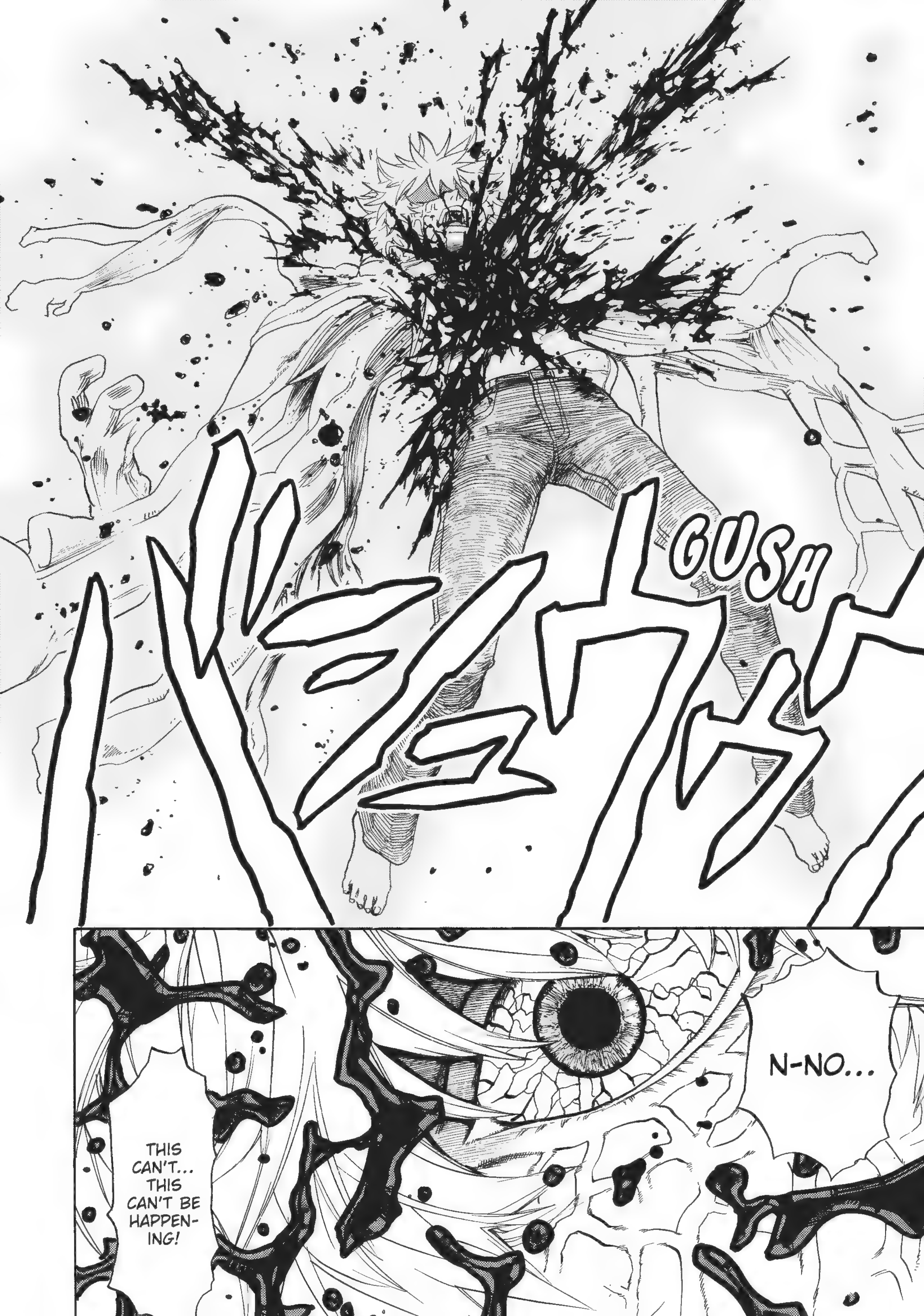

HEY, HOW LONG'RE YOU GONNA SIT THERE LIKE THAT?
WAAH
WAH
HAH...
LET'S GO GET THAT GUY... TOGETHER!
がしっ
GRAB
RIGHT ON.
KILLER T, NK...
PHEW
WE CAN'T LET THAT THING... THAT CANCER CELL BEAT US!
WE HAVE TO FIGHT FOR THIS BODY!!
LET'S GO!!!
DASH

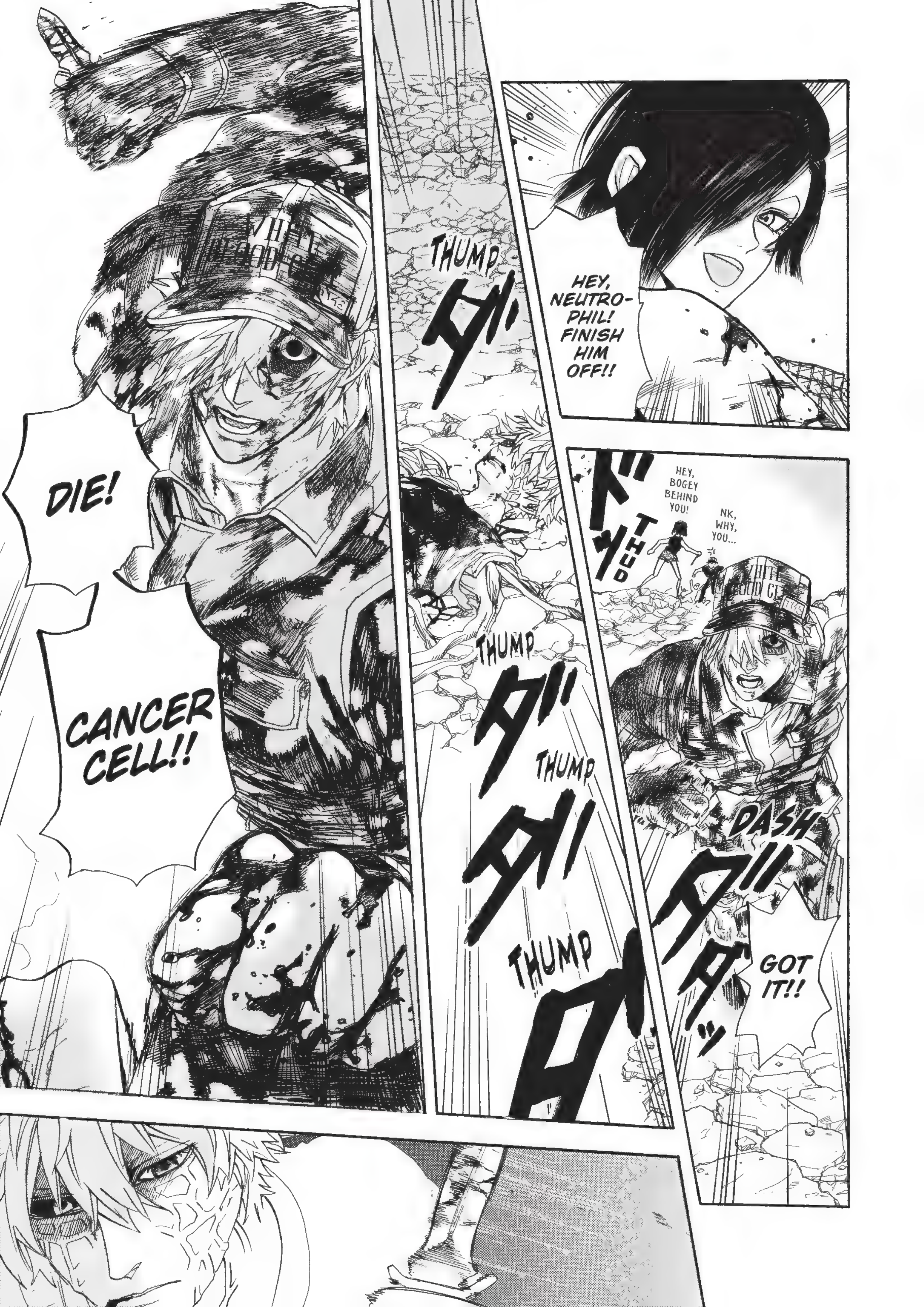

KILLER, DODGE TO YOUR RIGHT!!
AH!
HERE IT COMES!
OKAY! TO MY RIGHT!!
TAKE THIS! FULL POWER!!
WOW!
SPLOOSH
ドバババ
?!
PFFT!
AH HA HA HA! WHAT ARE YOU, STUPID?!
THAT'S THE SECOND TIME YOU FELL FOR THAT!!
NK!!
!?
WHAT'RE YOU DOING AT A TIME LIKE THIS?!
TEE HEE HEE
EE HEE HEE!
WHEE HEE
SO FUNNY. YOU'RE SO SIMPLE...
I'M DYING!
BWA HA HA HA!
AH HA HA HA
HEH HEH... SORRY, KILLER.
OHHHH... NOW THAT WAS A GOOD LAUGH.♡

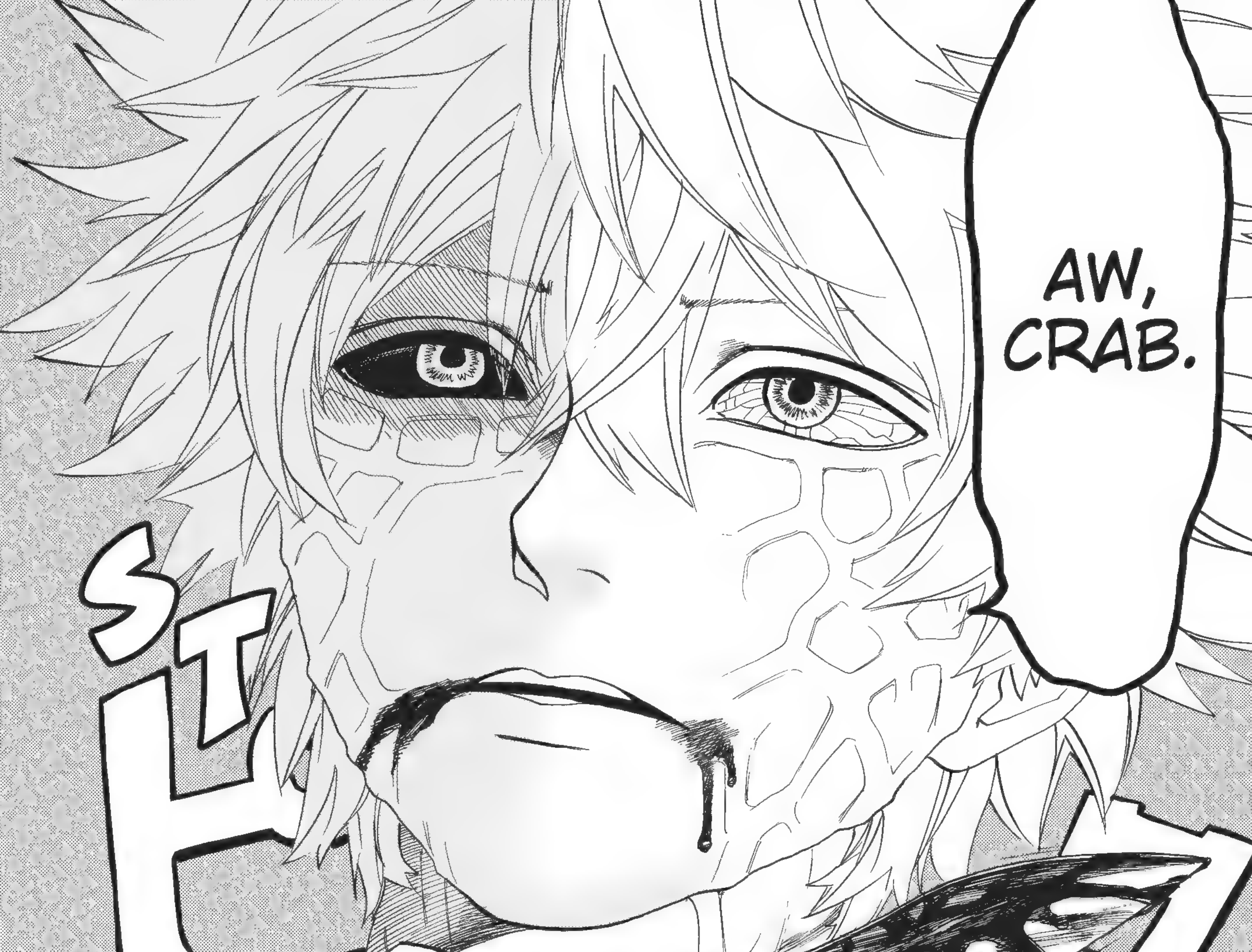

ALL THIS LAUGHING'S GOT ME GOOD AND ENERGIZED ...!!
SHO OOM
WH- WHAT'S HAPPEN- ING...?!
OH, THAT'S RIGHT. NK CELLS...
MONOCYTE

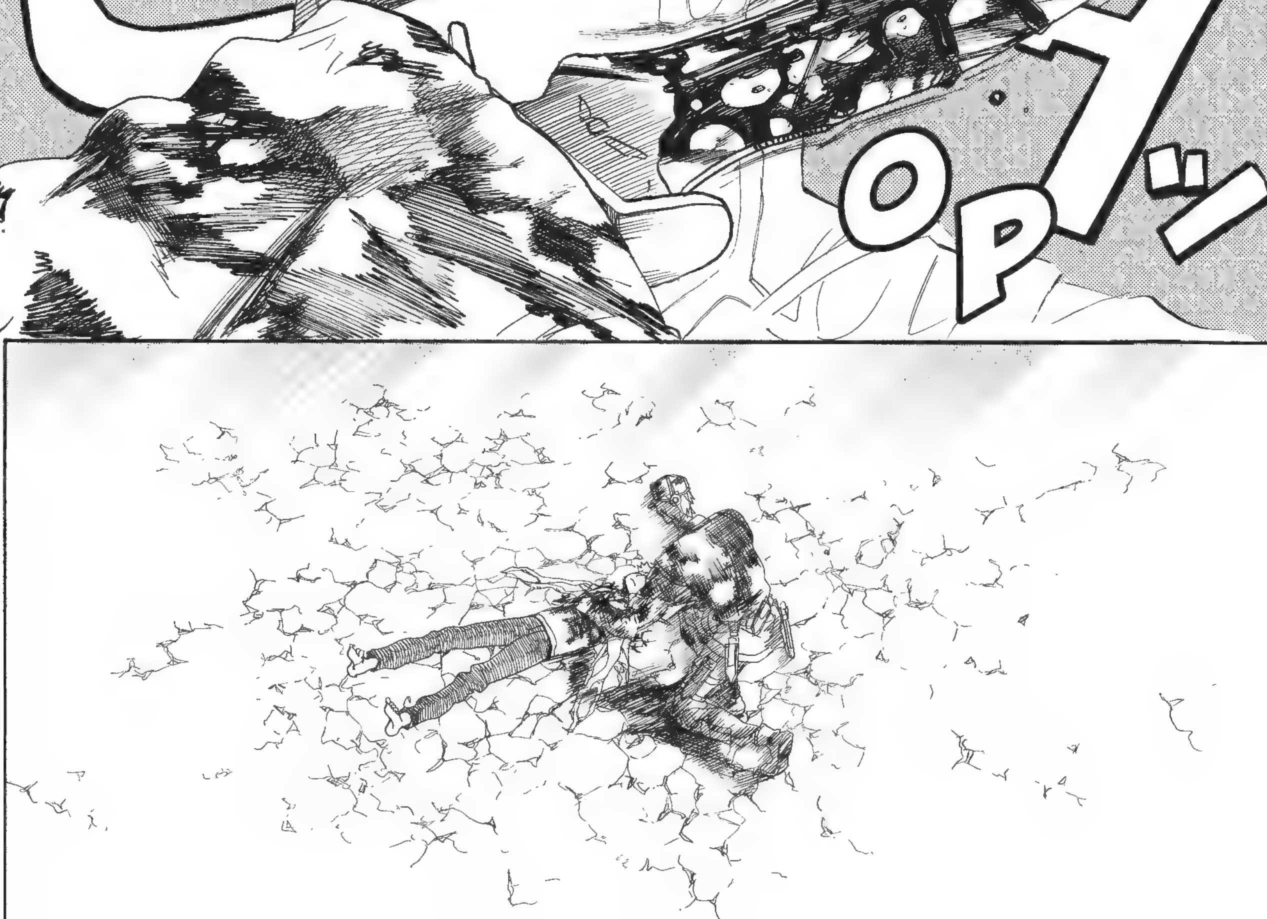

THMP THMP
THMP THMP
YOU DON'T STAND A CHANCE NOW! YOU SHOULD KNOW, NK CELLS LIKE ME...
SLASH
...ARE ACTIVATED BY LAUGHING!!!

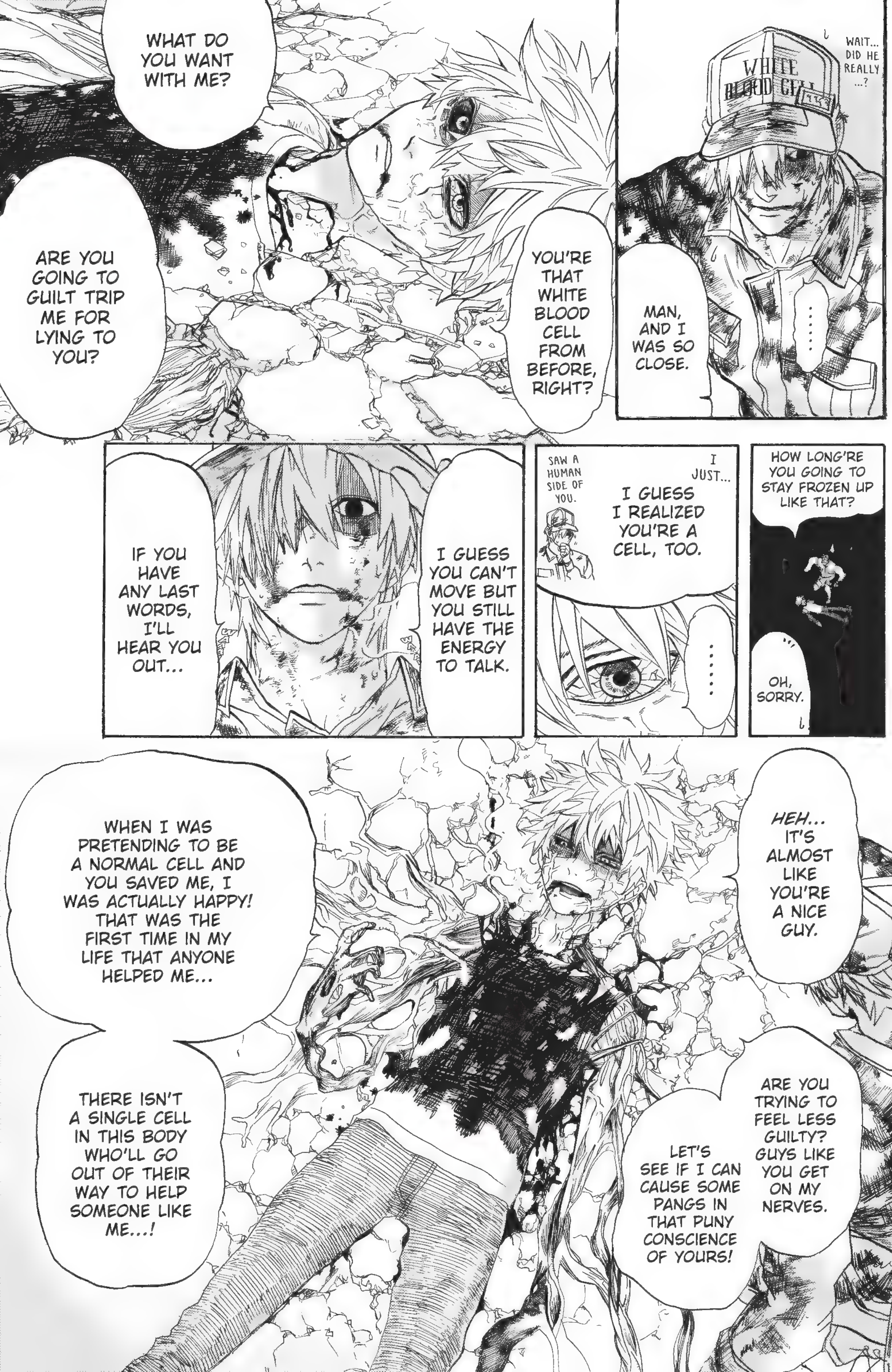
Activation of NK Cells
Laughter stimulates the diencephalon to trigger the rapid production of neurotransmitters called "neuropeptides." These chemicals attach to the surfaces of NK cells, activating them.

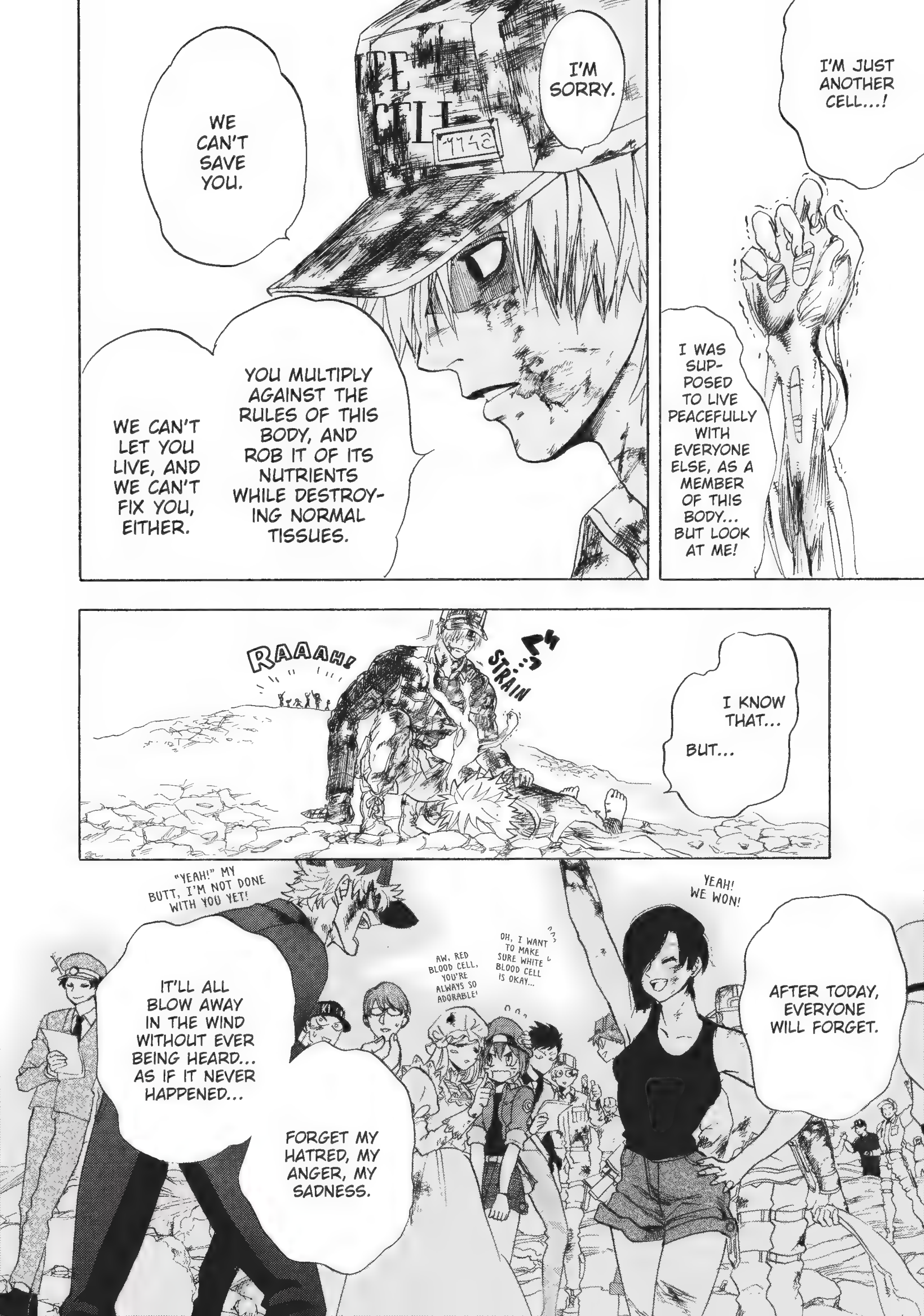

GUSH
N-NO...
THIS CAN'T... THIS CAN'T BE HAPPENING!

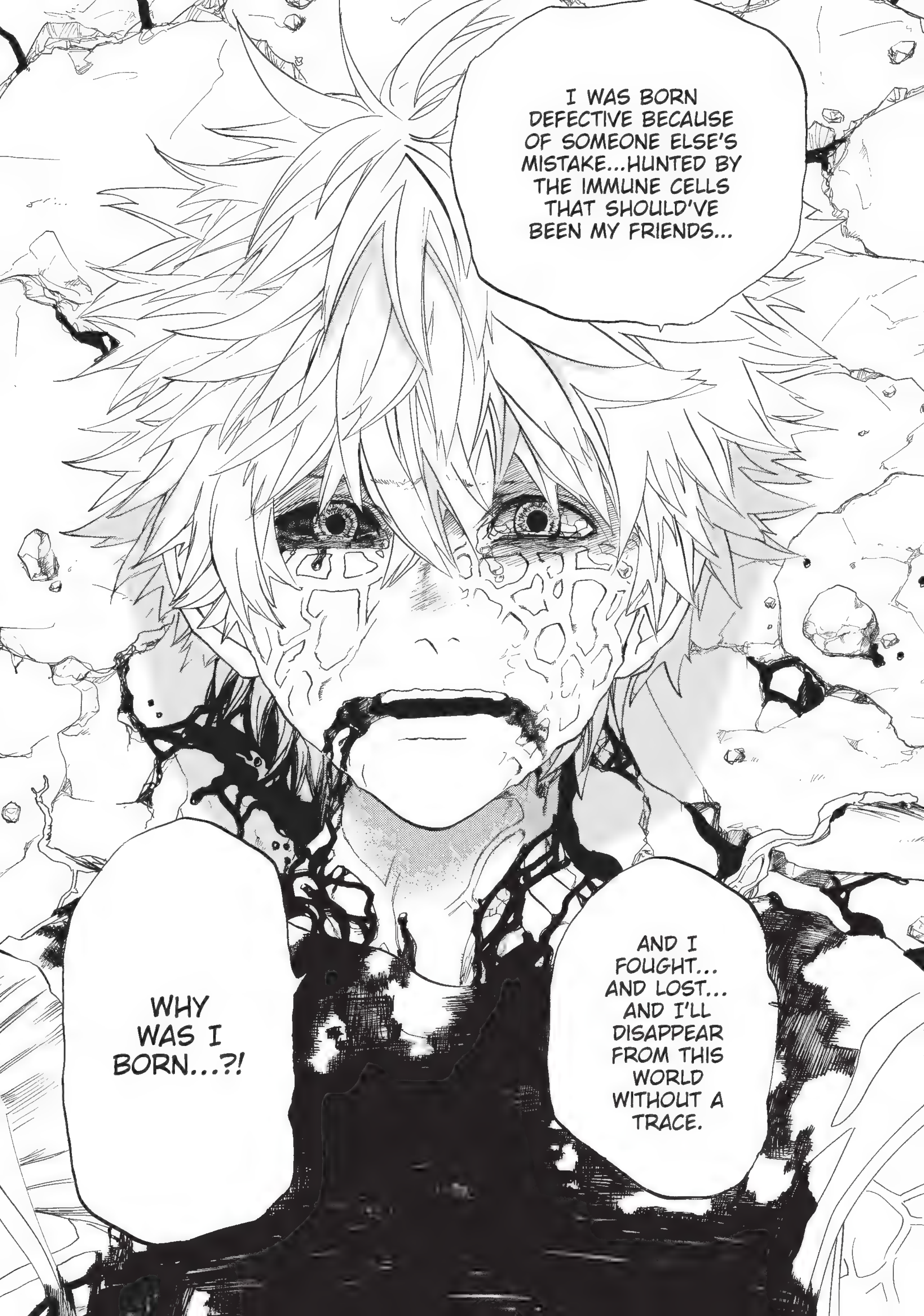

HEY, NEUTROPHIL! FINISH HIM OFF!!
HEY, BOGEY BEHIND YOU!
NK, WHY, YOU...
THUD
ドッ
DASH
ダッ
GOT IT!!
THUMP
ダッ
THUMP
ダッ
THUMP
ダッ
THUMP
ダッ
DIE!
CANCER CELL!!

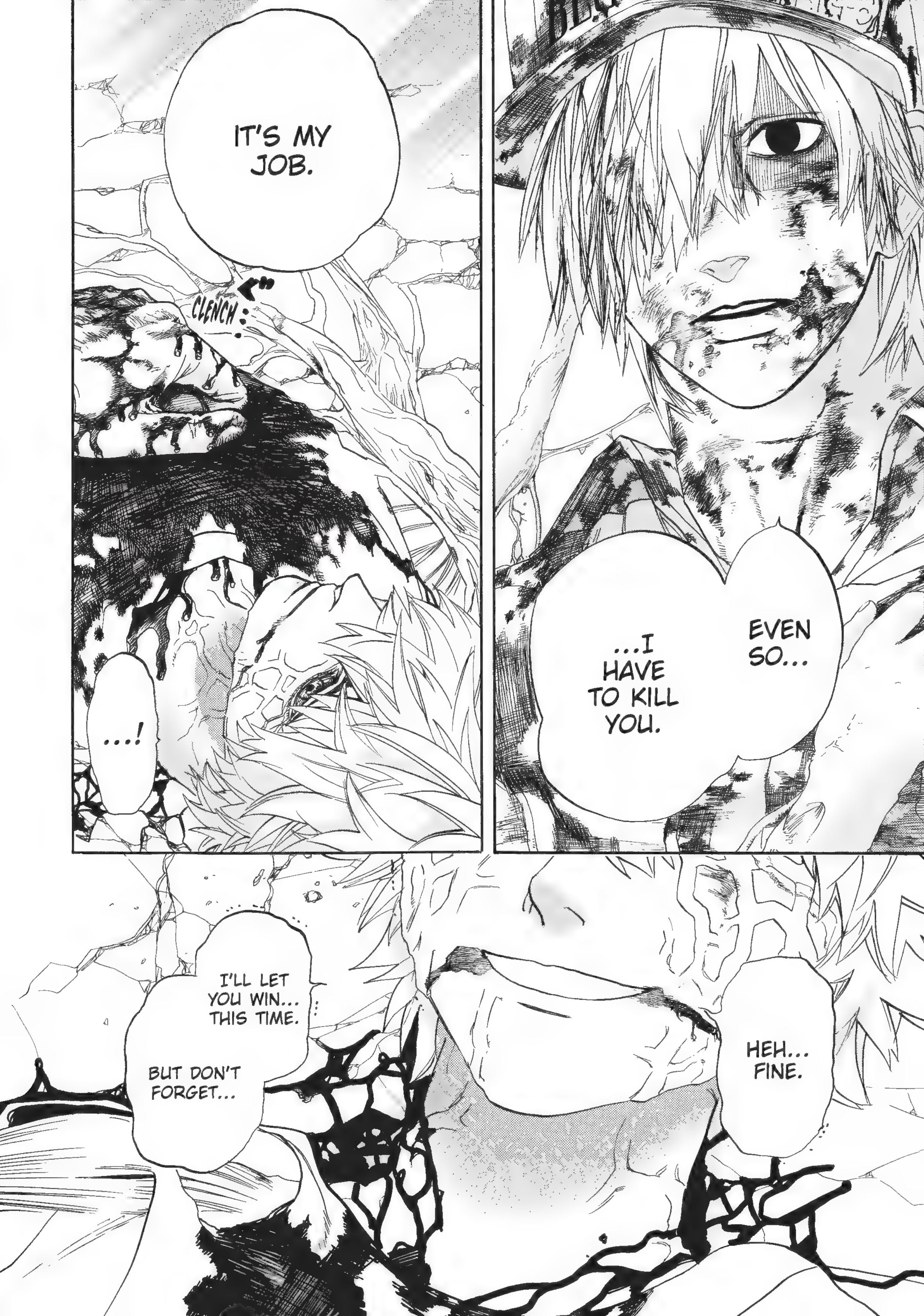

AW, CRAB.
STOP

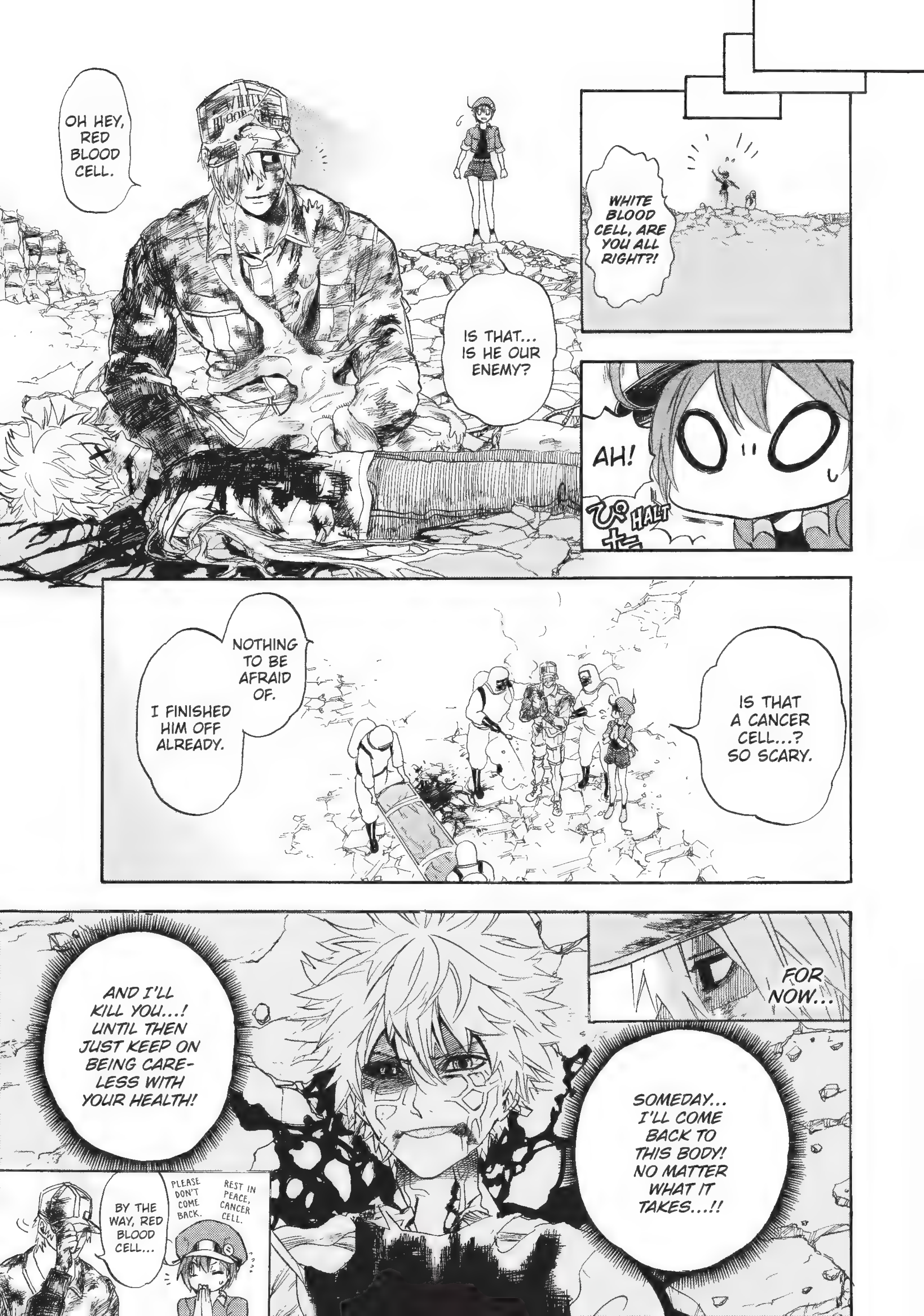


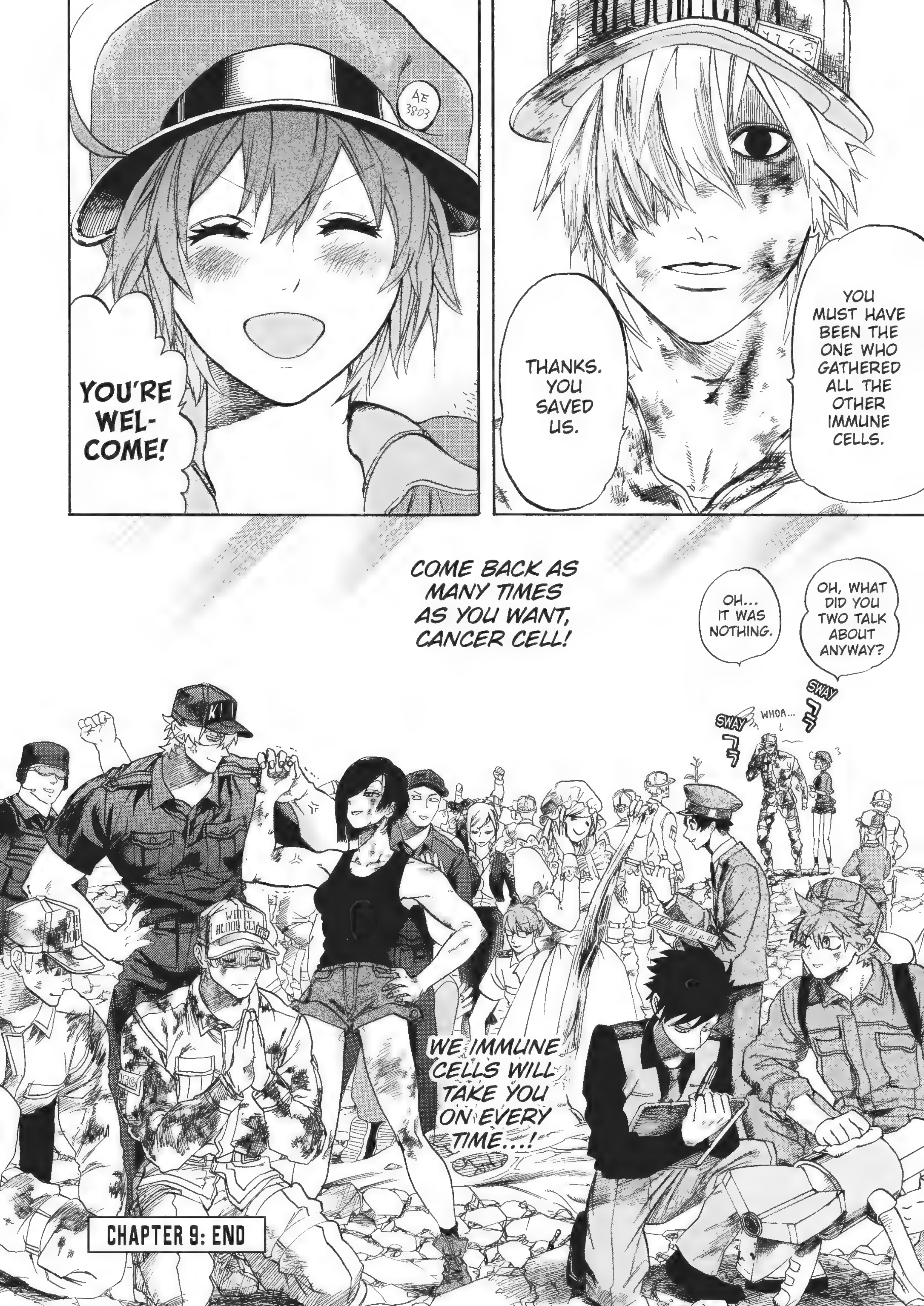

WHITE BLOOD CELL
WAIT... DID HE REALLY...?
......
MAN, AND I WAS SO CLOSE.
YOU'RE THAT WHITE BLOOD CELL FROM BEFORE, RIGHT?
WHAT DO YOU WANT WITH ME?
ARE YOU GOING TO GUILT TRIP ME FOR LYING TO YOU?
HOW LONG'RE YOU GOING TO STAY FROZEN UP LIKE THAT?
OH, SORRY.
......
I JUST... SAW A HUMAN SIDE OF YOU.
I GUESS I REALIZED YOU'RE A CELL, TOO.
I GUESS YOU CAN'T MOVE BUT YOU STILL HAVE THE ENERGY TO TALK.
IF YOU HAVE ANY LAST WORDS, I'LL HEAR YOU OUT...
HEH... IT'S ALMOST LIKE YOU'RE A NICE GUY.
ARE YOU TRYING TO FEEL LESS GUILTY? GUYS LIKE YOU GET ON MY NERVES.
LET'S SEE IF I CAN CAUSE SOME PANGS IN THAT PUNY CONSCIENCE OF YOURS!
WHEN I WAS PRETENDING TO BE A NORMAL CELL AND YOU SAVED ME, I WAS ACTUALLY HAPPY! THAT WAS THE FIRST TIME IN MY LIFE THAT ANYONE HELPED ME...
THERE ISN'T A SINGLE CELL IN THIS BODY WHO'LL GO OUT OF THEIR WAY TO HELP SOMEONE LIKE ME...!

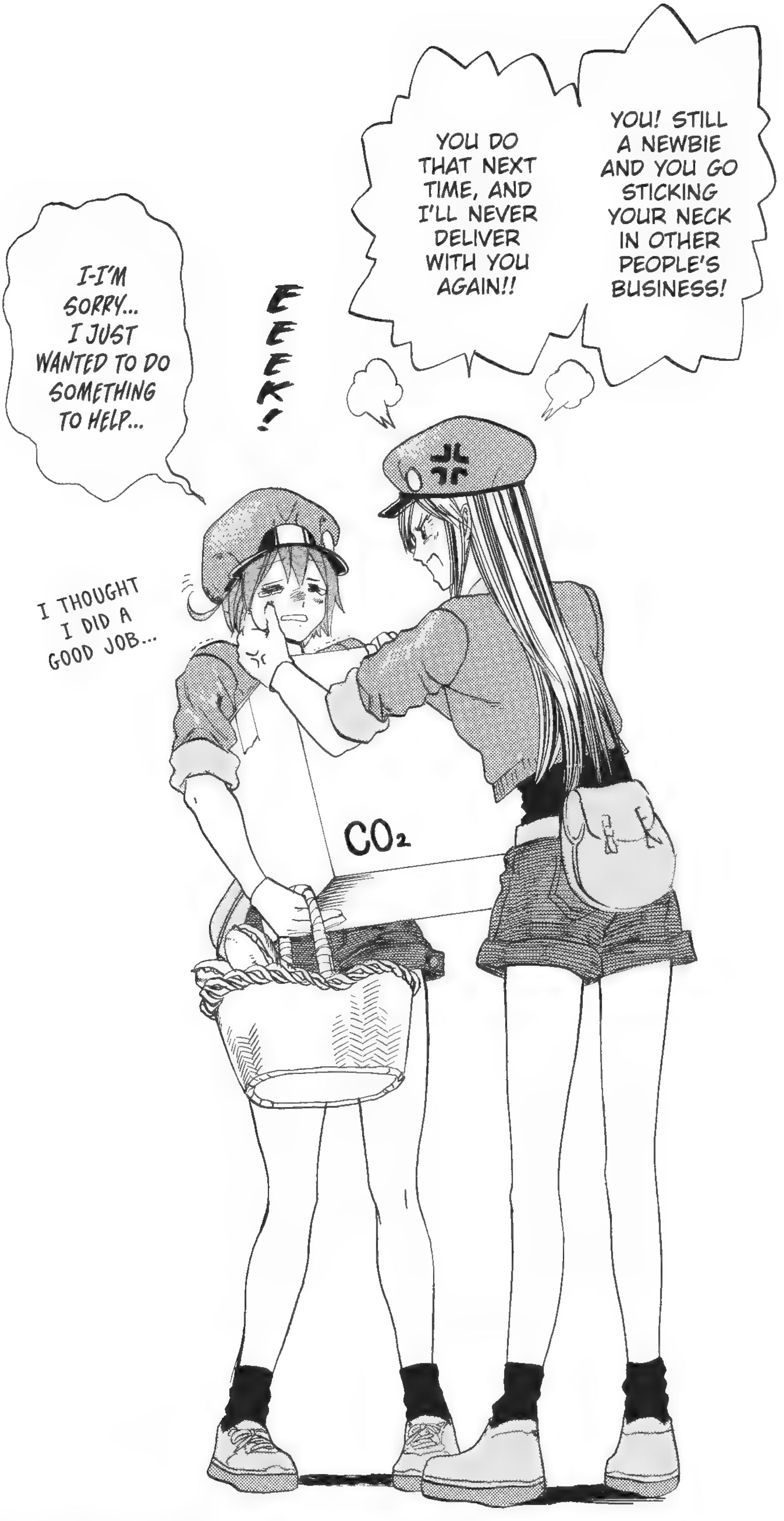

I'M JUST ANOTHER CELL...!
I WAS SUPPOSED TO LIVE PEACEFULLY WITH EVERYONE ELSE, AS A MEMBER OF THIS BODY... BUT LOOK AT ME!
I'M SORRY.
WE CAN'T SAVE YOU.
YOU MULTIPLY AGAINST THE RULES OF THIS BODY, AND ROB IT OF ITS NUTRIENTS WHILE DESTROYING NORMAL TISSUES.
WE CAN'T LET YOU LIVE, AND WE CAN'T FIX YOU, EITHER.
STRAIN
RAAAH!
I KNOW THAT...
BUT...
AFTER TODAY, EVERYONE WILL FORGET.
YEAH! WE WON!
OH, I WANT TO MAKE SURE WHITE BLOOD CELL IS OKAY...
AW, RED BLOOD CELL, YOU'RE ALWAYS SO ADORABLE!
"YEAH!" MY BUTT, I'M NOT DONE WITH YOU YET!
IT'LL ALL BLOW AWAY IN THE WIND WITHOUT EVER BEING HEARD... AS IF IT NEVER HAPPENED...
FORGET MY HATRED, MY ANGER, MY SADNESS.


I WAS BORN DEFECTIVE BECAUSE OF SOMEONE ELSE'S MISTAKE...HUNTED BY THE IMMUNE CELLS THAT SHOULD'VE BEEN MY FRIENDS...
AND I FOUGHT... AND LOST... AND I'LL DISAPPEAR FROM THIS WORLD WITHOUT A TRACE.
WHY WAS I BORN...?!


EVEN SO...
...I HAVE TO KILL YOU.
IT'S MY JOB.
CLENCH
...!
HEH... FINE.
I'LL LET YOU WIN... THIS TIME.
BUT DON'T FORGET...

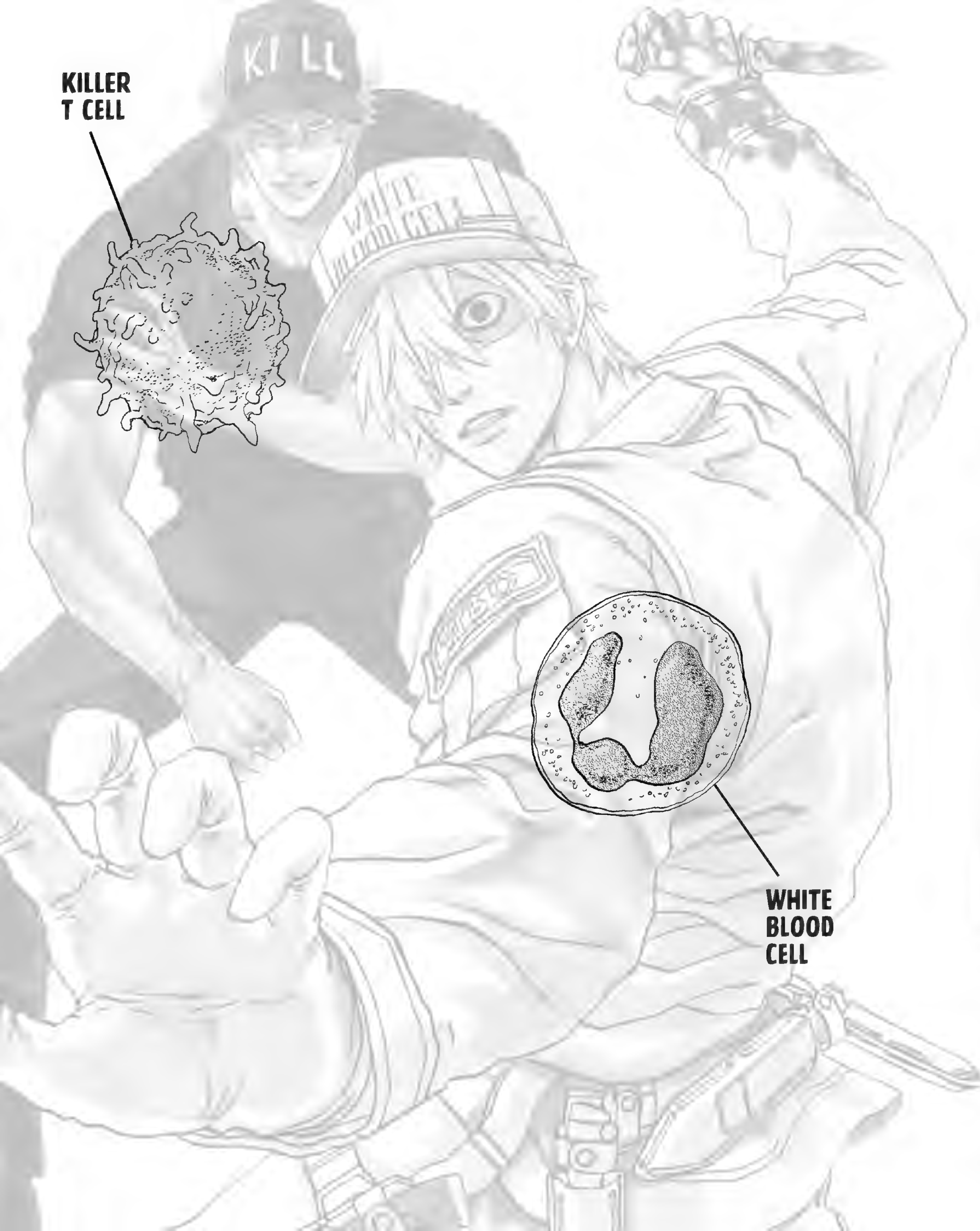

WHITE BLOOD CELL, ARE YOU ALL RIGHT?!
AH!
ぴ HALT
た
IS THAT... IS HE OUR ENEMY?
OH HEY, RED BLOOD CELL.
IS THAT A CANCER CELL...? SO SCARY.
NOTHING TO BE AFRAID OF.
I FINISHED HIM OFF ALREADY.
FOR NOW...
SOMEDAY... I'LL COME BACK TO THIS BODY! NO MATTER WHAT IT TAKES...!!
AND I'LL KILL YOU...! UNTIL THEN JUST KEEP ON BEING CARELESS WITH YOUR HEALTH!
REST IN PEACE, CANCER CELL.
PLEASE DON'T COME BACK.
BY THE WAY, RED BLOOD CELL...


YOU MUST HAVE BEEN THE ONE WHO GATHERED ALL THE OTHER IMMUNE CELLS.
THANKS. YOU SAVED US.
AE 3803
YOU'RE WEL-COME!
COME BACK AS MANY TIMES AS YOU WANT, CANCER CELL!
OH, WHAT DID YOU TWO TALK ABOUT ANYWAY?
OH... IT WAS NOTHING.
SWAY
WHOA...
SWAY
KI
WHITE BLOOD CELL
WE IMMUNE CELLS WILL TAKE YOU ON EVERY TIME...!
CHAPTER 9: END


YOU! STILL A NEWBIE AND YOU GO STICKING YOUR NECK IN OTHER PEOPLE'S BUSINESS!
YOU DO THAT NEXT TIME, AND I'LL NEVER DELIVER WITH YOU AGAIN!!
EEEEK!
I-I'M SORRY... I JUST WANTED TO DO SOMETHING TO HELP...
I THOUGHT I DID A GOOD JOB...
CO2

CELLS AT WORK! VOLUME 2: END

Medical Editor: Tomoyuki Harada

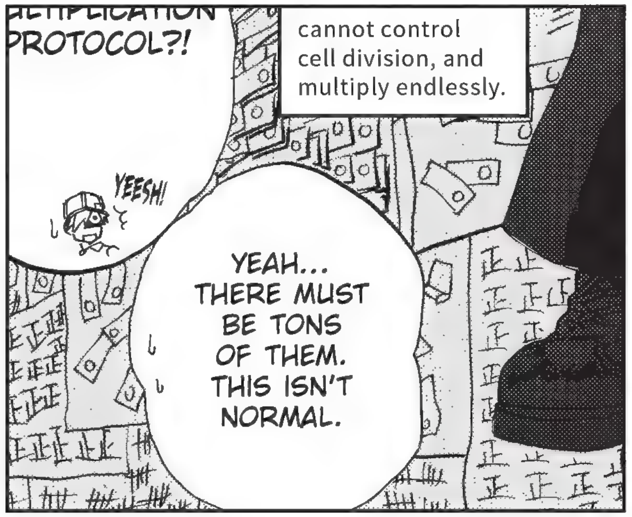

KILLER T CELL
WHITE BLOOD CELL

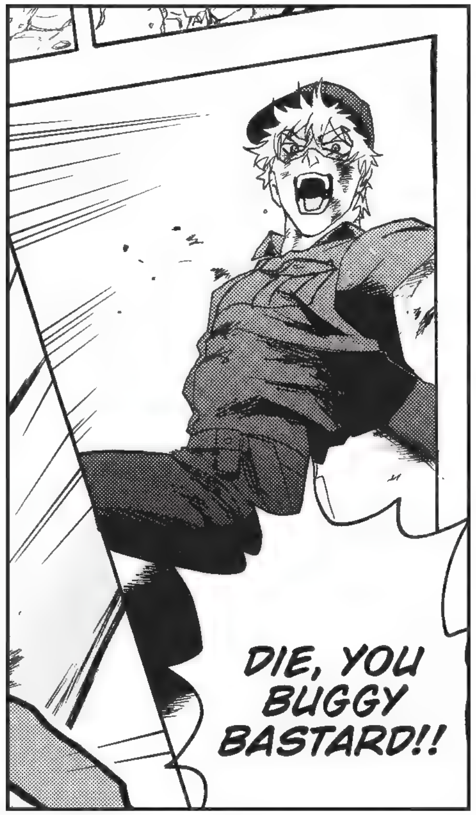
TRANSLATION NOTES

Tally marks

Page 124

The Japanese character 正 (meaning "right," "true," or "correct") is commonly used to count to five, just like tally counts using four vertical lines and one slash through them for "five" (卌).


PROTOCOL?!
cannot control cell division, and multiply endlessly.
YEESH!
YEAH... THERE MUST BE TONS OF THEM. THIS ISN'T NORMAL.


DIE, YOU BUGGY BASTARD!!

Buggy bastard

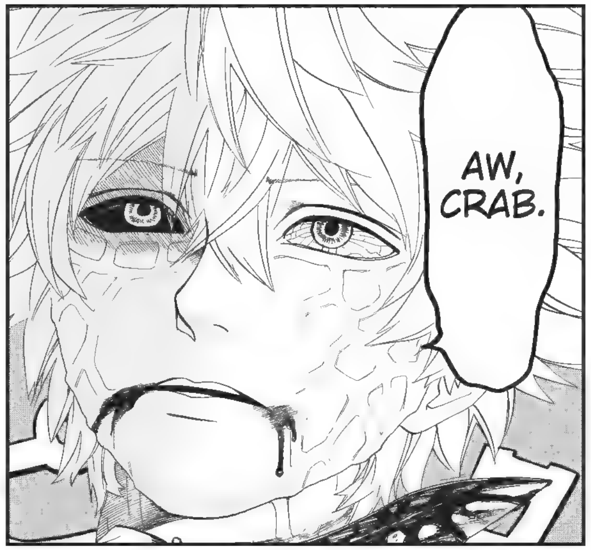
Page 140

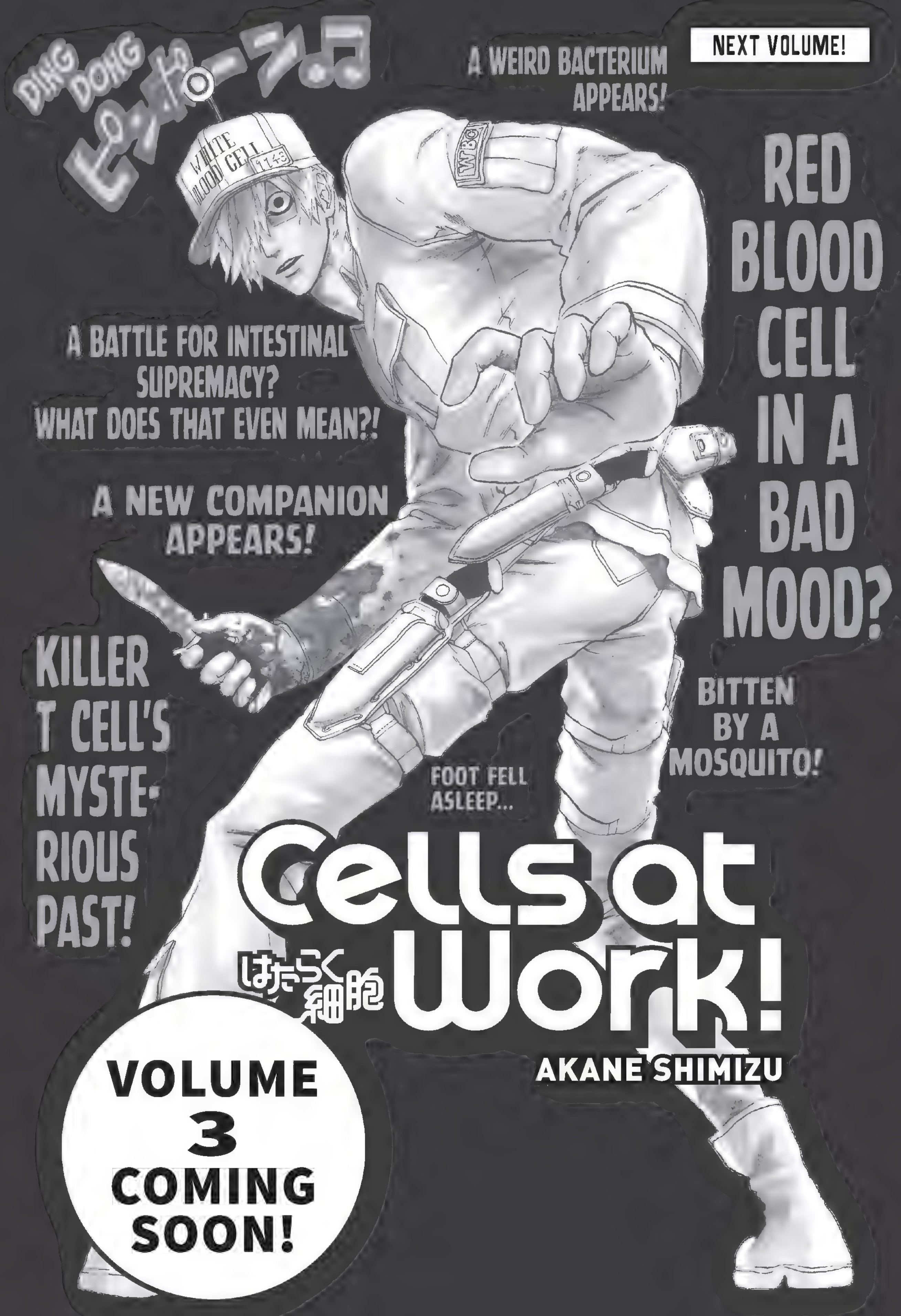
In the Japanese edition, the immune cells insult the cancer cell by calling him *baguri-yaro*. The term "baguri" comes from the verb "baguru," which a slang term describing what software does when it has bugs—an apt insult for a renegade cancer cell. Baguri also may echo the term *pakuri*, meaning plagiarism, which would make sense given that cancerous cells are poor copies of the original.

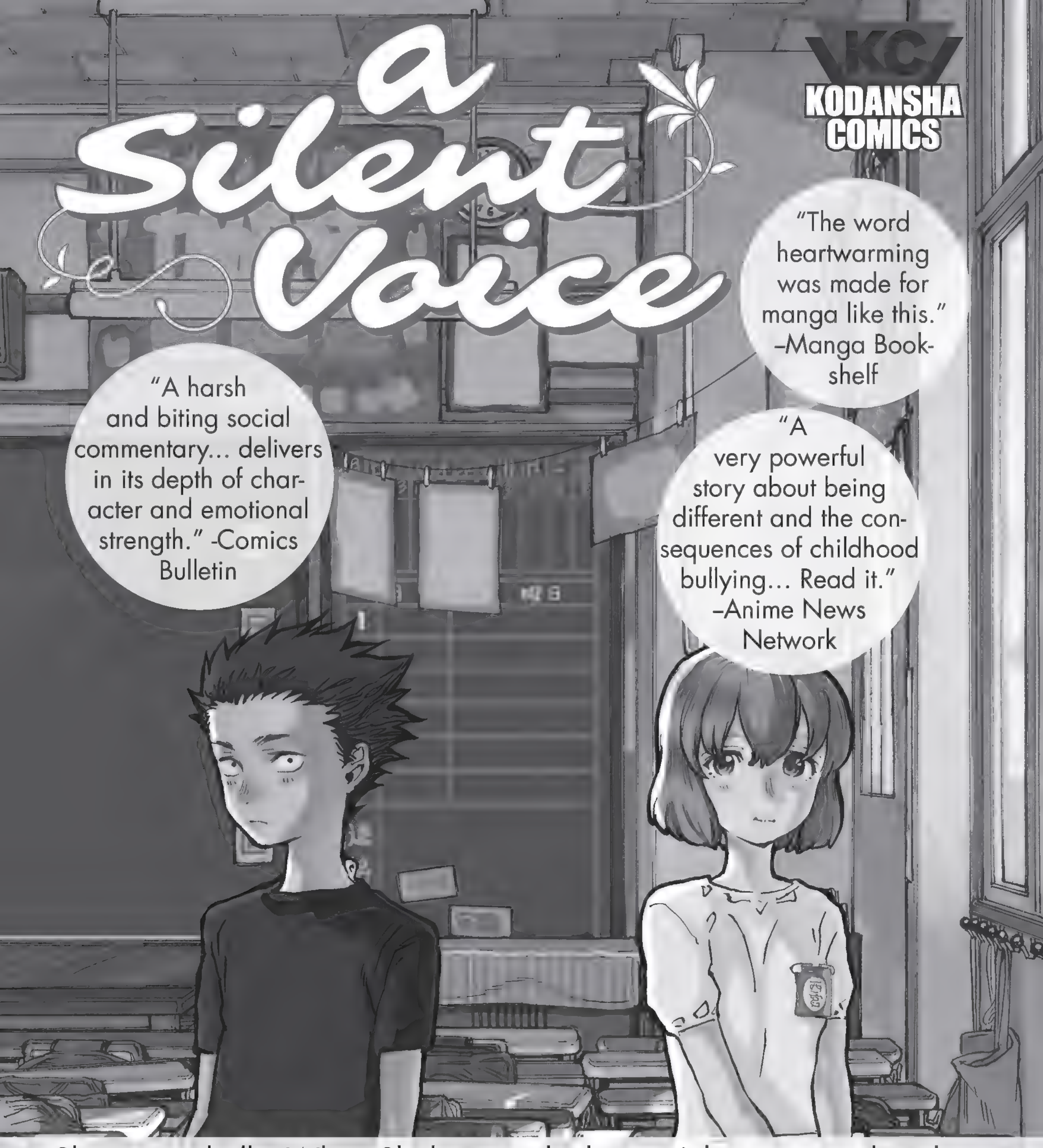
Aw, crab

Page 156

In his final moments, the cancer cell makes a terrible pun. He says "Gaan," which is an exclamation expressing shock or dismay. "Gan" is also the Japanese word for cancer. In this version, he murmurs "crab," the Latin term for which gives us the word "cancer" (and is the namesake for the constellation).




NEXT VOLUME!
DING DONG
ピンポーン♪♫
WHITE BLOOD CELL 1146
WBC
A WEIRD BACTERIUM APPEARS!
RED BLOOD CELL IN A BAD MOOD?
A BATTLE FOR INTESTINAL SUPREMACY? WHAT DOES THAT EVEN MEAN?!
A NEW COMPANION APPEARS!
KILLER T CELL'S MYSTERIOUS PAST!
BITTEN BY A MOSQUITO!
FOOT FELL ASLEEP...
Cells at Work!
はたらく細胞
AKANE SHIMIZU
VOLUME 3 COMING SOON!



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a Silent Voice

"The word heartwarming was made for manga like this." –Manga Bookshelf

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"A very powerful story about being different and the consequences of childhood bullying... Read it." –Anime News Network

Shoya is a bully. When Shoko, a girl who can't hear, enters his elementary school class, she becomes their favorite target, and Shoya and his friends goad each other into devising new tortures for her. But the children's cruelty goes too far. Shoko is forced to leave the school, and Shoya ends up shouldering all the blame. Six years later, the two meet again. Can Shoya make up for his past mistakes, or is it too late?

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DON'T MISS THE MOST ACCLAIMED ACTION MANGA OF 2013!

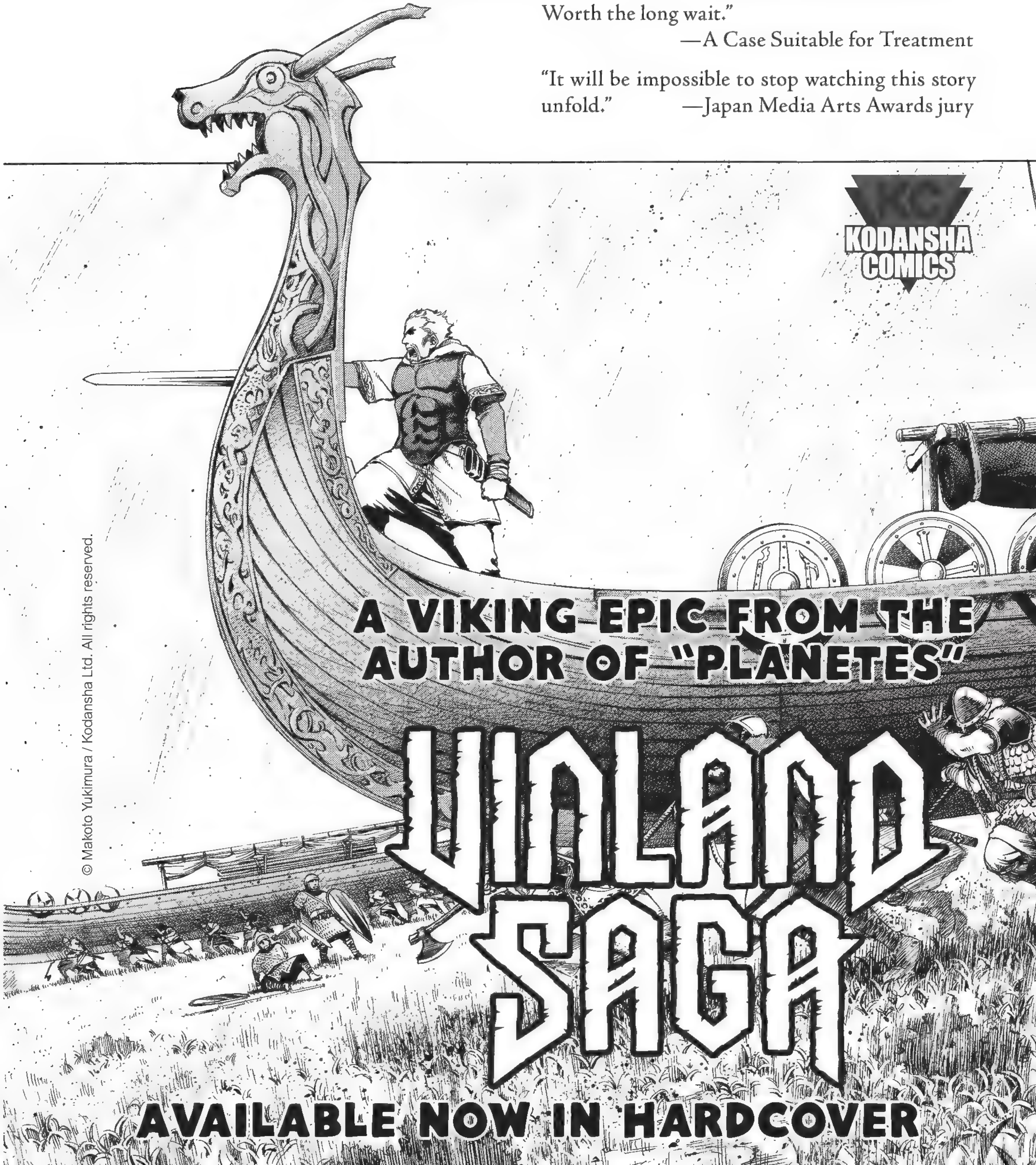
"Gripping doesn't begin to describe Vinland Saga. 5 stars."
—ICv2

"Deeply engrossing... If you have any interest at all in Vikings, the Medieval period, or pirates, this is not a series you want to miss."
—Anime News Network

"The art is gorgeous, a combination of beautiful cartooning and realistic backgrounds. Yukimura is also a master of pacing, both in frenetic battle scenes and charged emotional moments."
—Faith Erin Hicks, *Friends With Boys*

"For those who love Berserk, you'll love this too... Worth the long wait."
—A Case Suitable for Treatment

"It will be impossible to stop watching this story unfold."
—Japan Media Arts Awards jury


KC
KODANSHA COMICS
A VIKING EPIC FROM THE AUTHOR OF "PLANETES"
VINLAND SAGA
AVAILABLE NOW IN HARDCOVER

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Praise for the anime:

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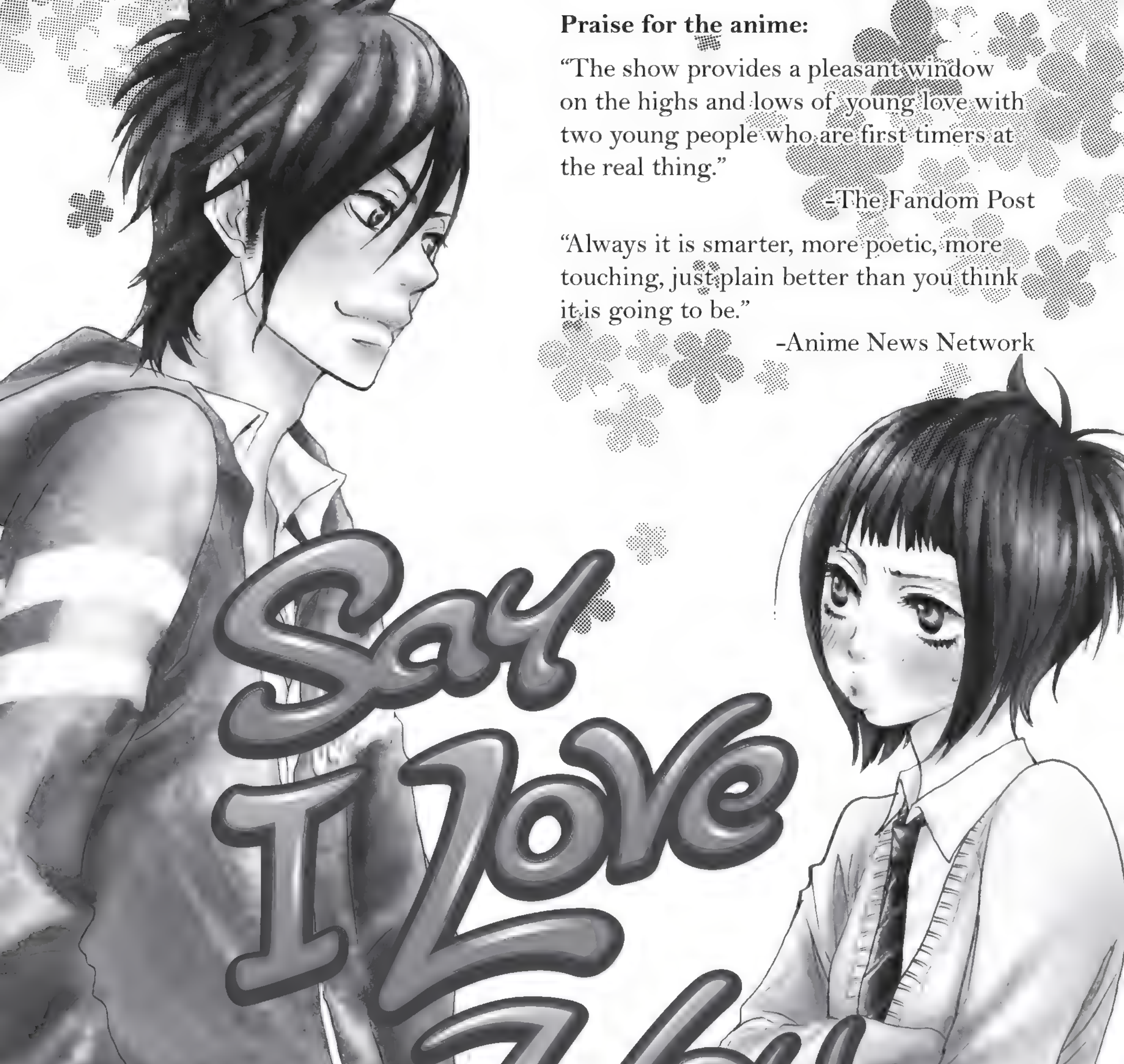
-The Fandom Post

"Always it is smarter, more poetic, more touching, just plain better than you think it is going to be."

-Anime News Network



Mei Tachibana has no friends — and says she doesn't need them!

But everything changes when she accidentally roundhouse kicks the most popular boy in school! However, Yamato Kurosawa isn't angry in the slightest—in fact, he thinks his ordinary life could use an unusual girl like Mei. But winning Mei's trust will be a tough task. How long will she refuse to say, "I love you"?

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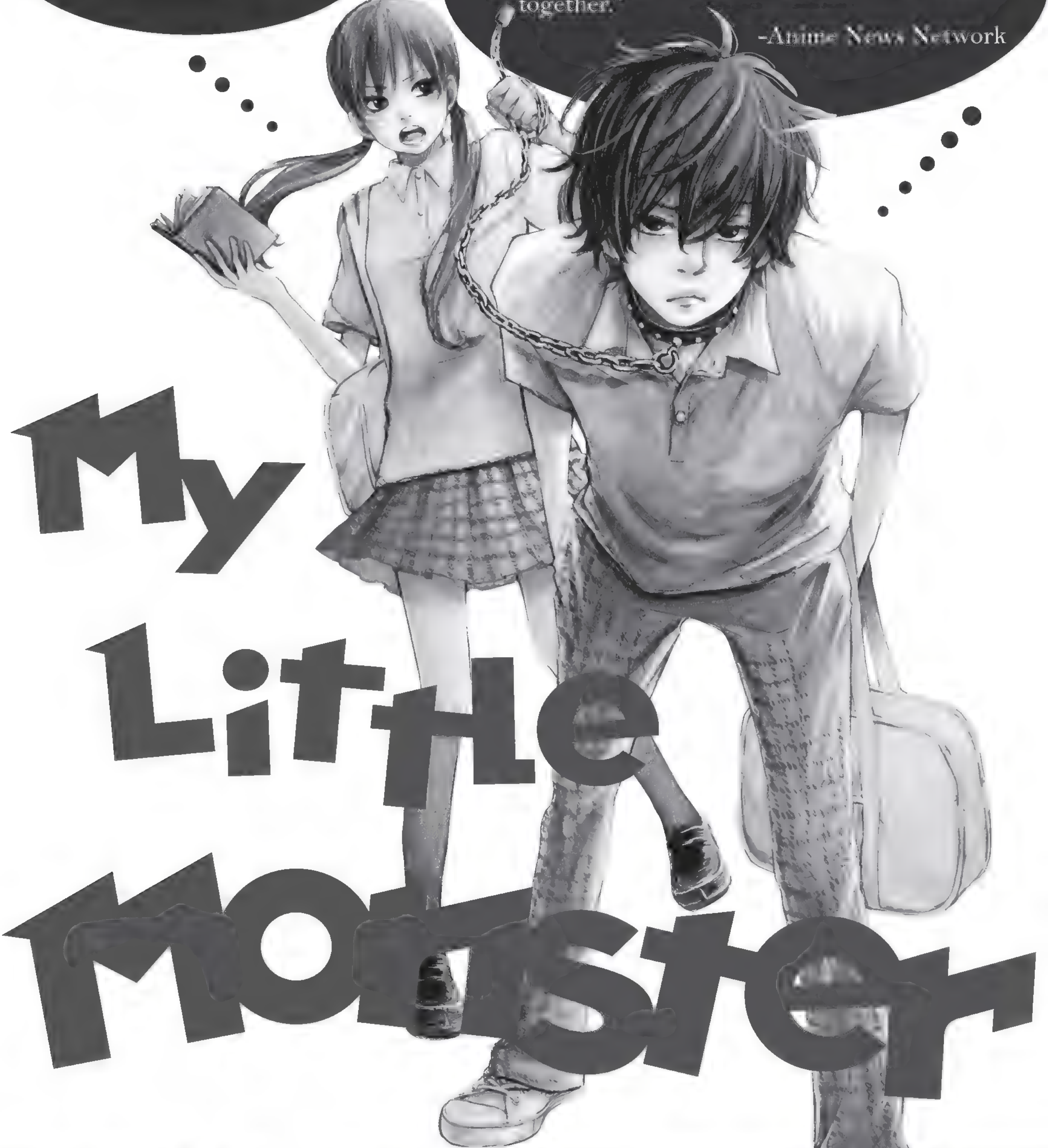
PRAISE FOR THE ANIME!

"This series never fails to put a smile on my face."
-Dramatic Reviews

"A very funny look at what happens when two strange and strangely well-suited people try to navigate the thorny path to true love together."
-Anime News Network



OPPOSITES ATTRACT...MAYBE?

Haru Yoshida is feared as an unstable and violent "monster." Mizutani Shizuku is a grade-obsessed student with no friends. Fate brings these two together to form the most unlikely pair. Haru firmly believes he's in love with Mizutani and she firmly believes he's insane.

KC
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Maria
THE VIRGIN WITCH

"Maria's brand of righteous justice, passion and plain talking make for one of the freshest manga series of 2015. I dare any other book to top it."
—UK Anime Network

PURITY AND POWER

As a war to determine the rightful ruler of medieval France ravages the land, the witch Maria decides she will not stand idly by as men kill each other in the name of God and glory. Using her powerful magic, she summons various beasts and demons —even going as far as using a succubus to seduce soldiers into submission under the veil of night— all to stop the needless slaughter. However, after the Archangel Michael puts an end to her meddling, he curses her to lose her powers if she ever gives up her virginity. Will she forgo the forbidden fruit of adulthood in order to bring an end to the merciless machine of war?
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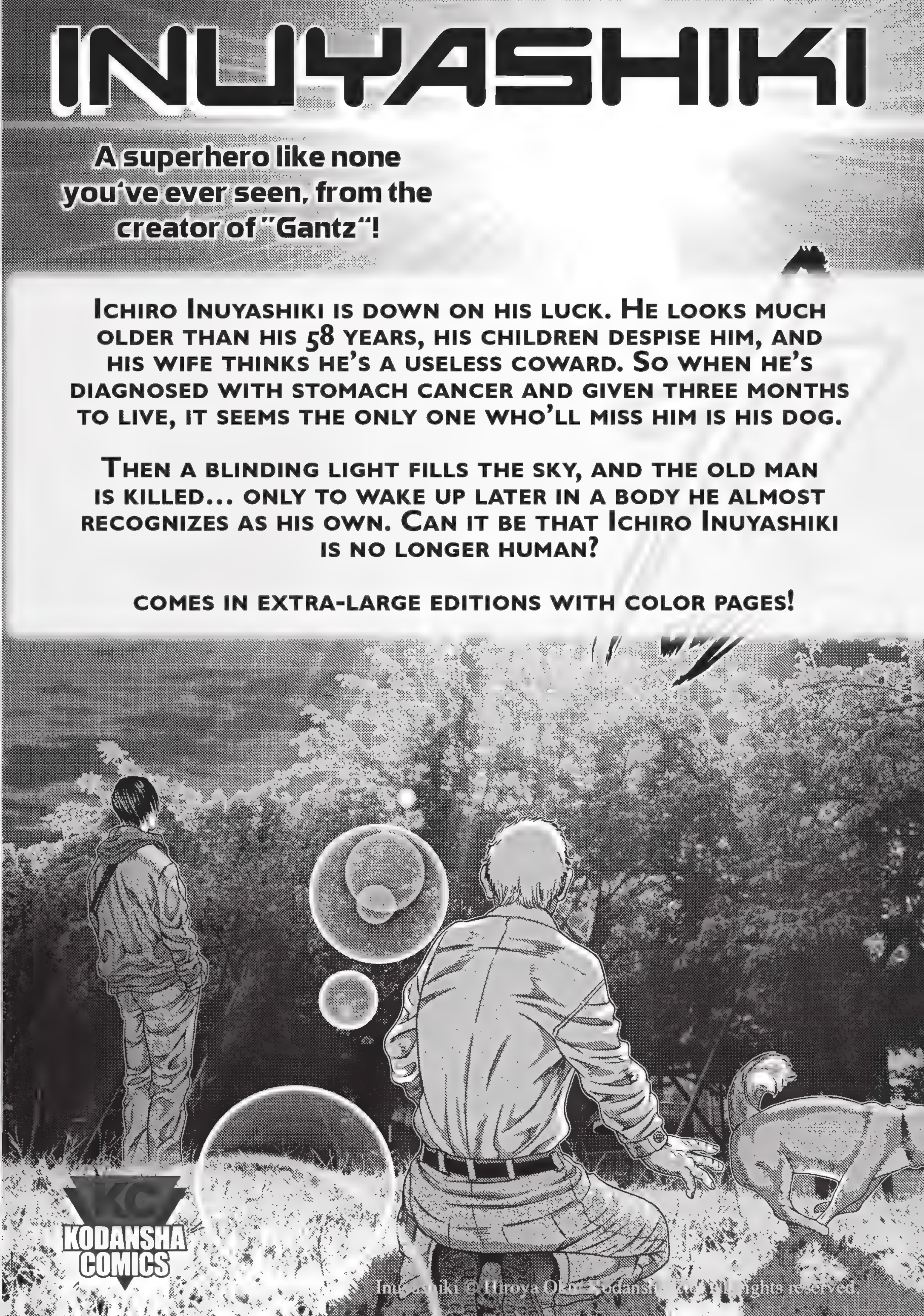

INUYASHIKI

A superhero like none
you've ever seen, from the
creator of "Gantz"!

Ichiro Inuyashiki is down on his luck. He looks much older than his 58 years, his children despise him, and his wife thinks he's a useless coward. So when he's diagnosed with stomach cancer and given three months to live, it seems the only one who'll miss him is his dog.

Then a blinding light fills the sky, and the old man is killed… only to wake up later in a body he almost recognizes as his own. Can it be that Ichiro Inuyashiki is no longer human?

COMES IN EXTRA-LARGE EDITIONS WITH COLOR PAGES!

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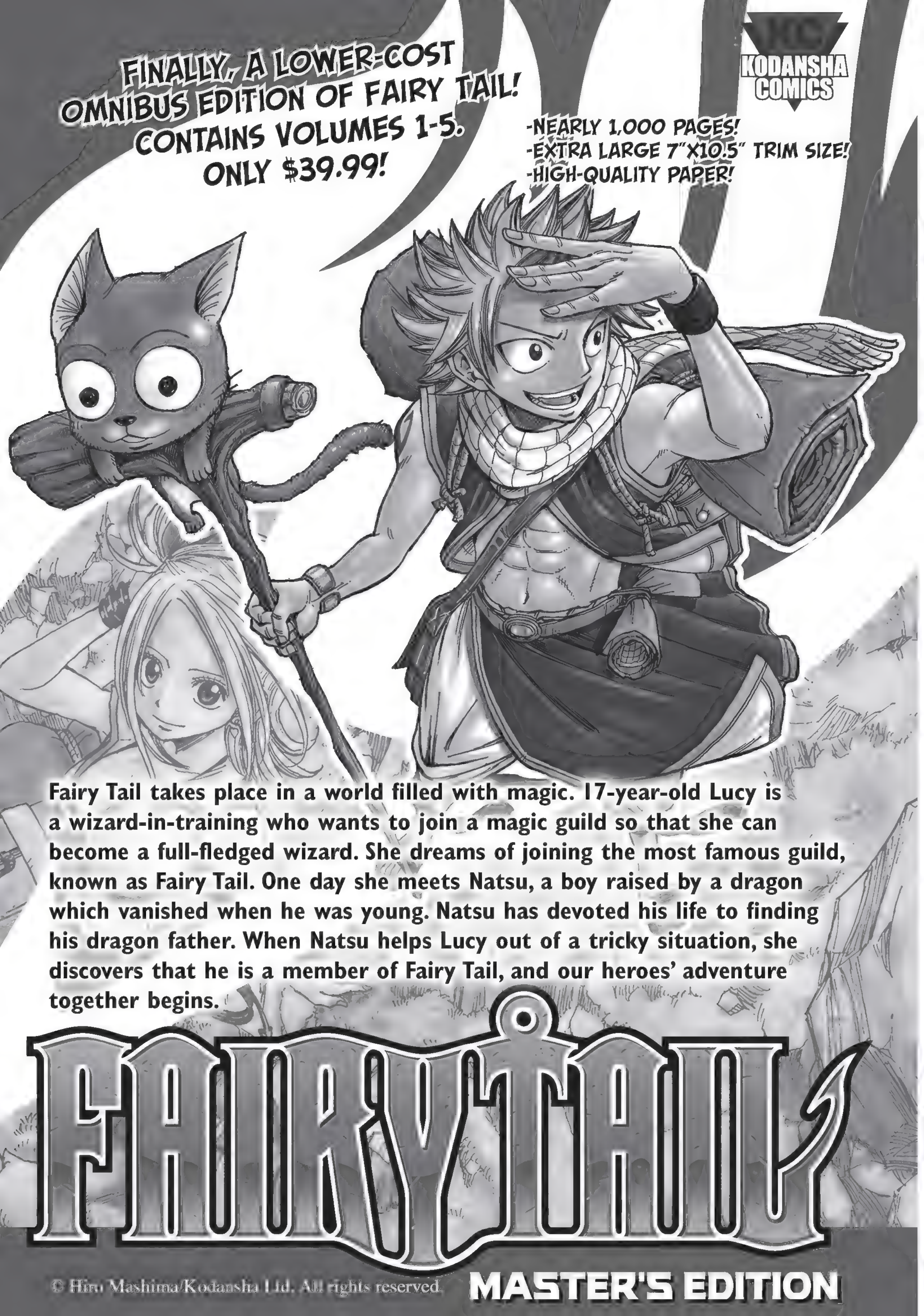

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FAIRY TAIL

MASTER'S EDITION

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Cells at Work! 2

KODANSHA COMICS Digital Edition

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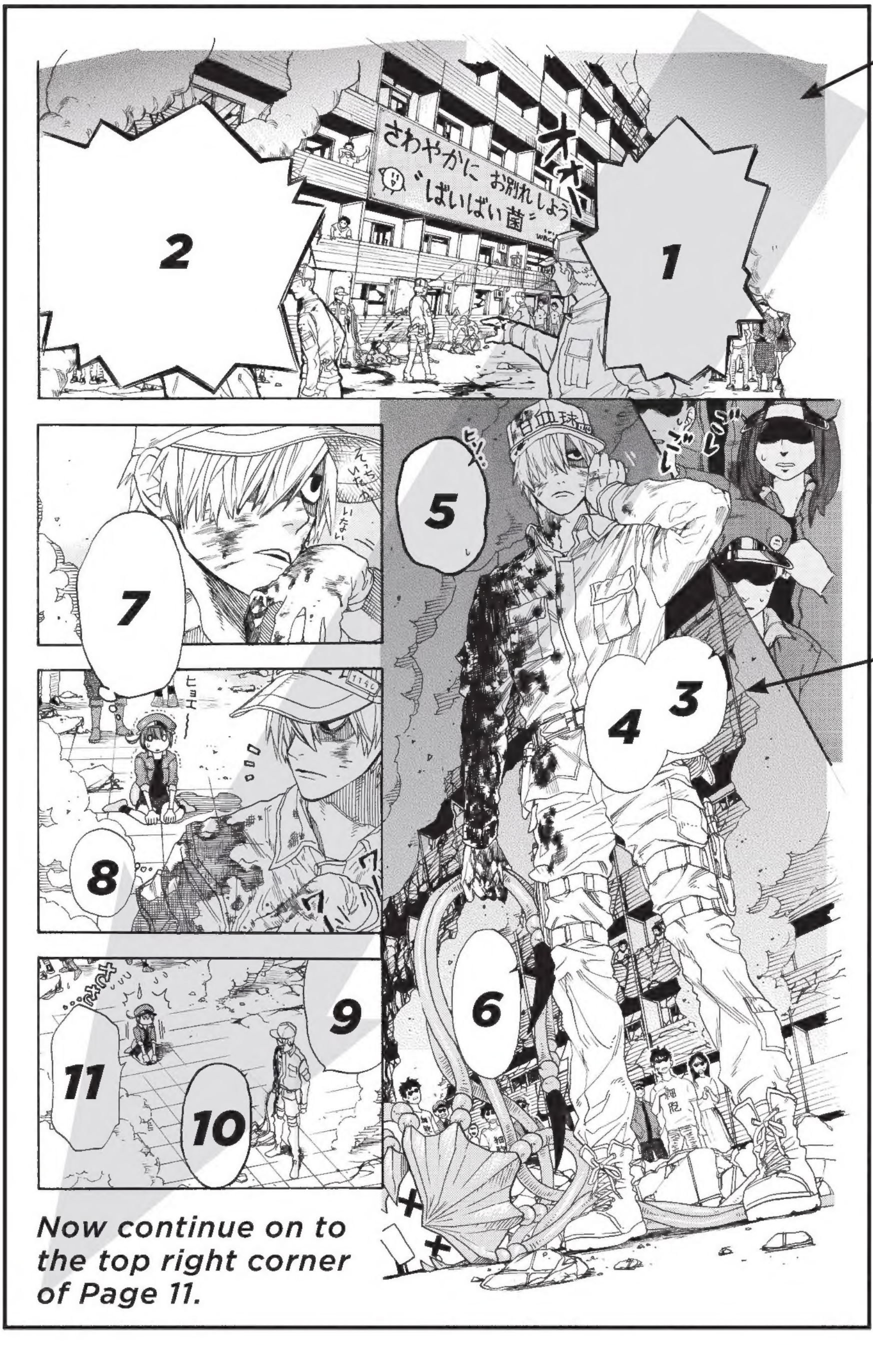
Translation: Yamato Tanaka
Lettering: Abigail Blackman
Editing: Paul Starr
Kodansha Comics edition cover design: Phil Balsman

HOW TO READ MANGA

Japanese is written right to left and top to bottom. This means that for a reader accustomed to Western languages, Japanese books read “backwards.” Since most manga published in English now keeps the Japanese page order, it can take a little getting used to—but once you learn how, it’s a snap. Here’s a handy guide!

Here you can see pages 10-11 from Volume 1 of *Cells at Work*. The speech balloons have been numbered in the order you should read them in.

Page 10*—read this one first!*

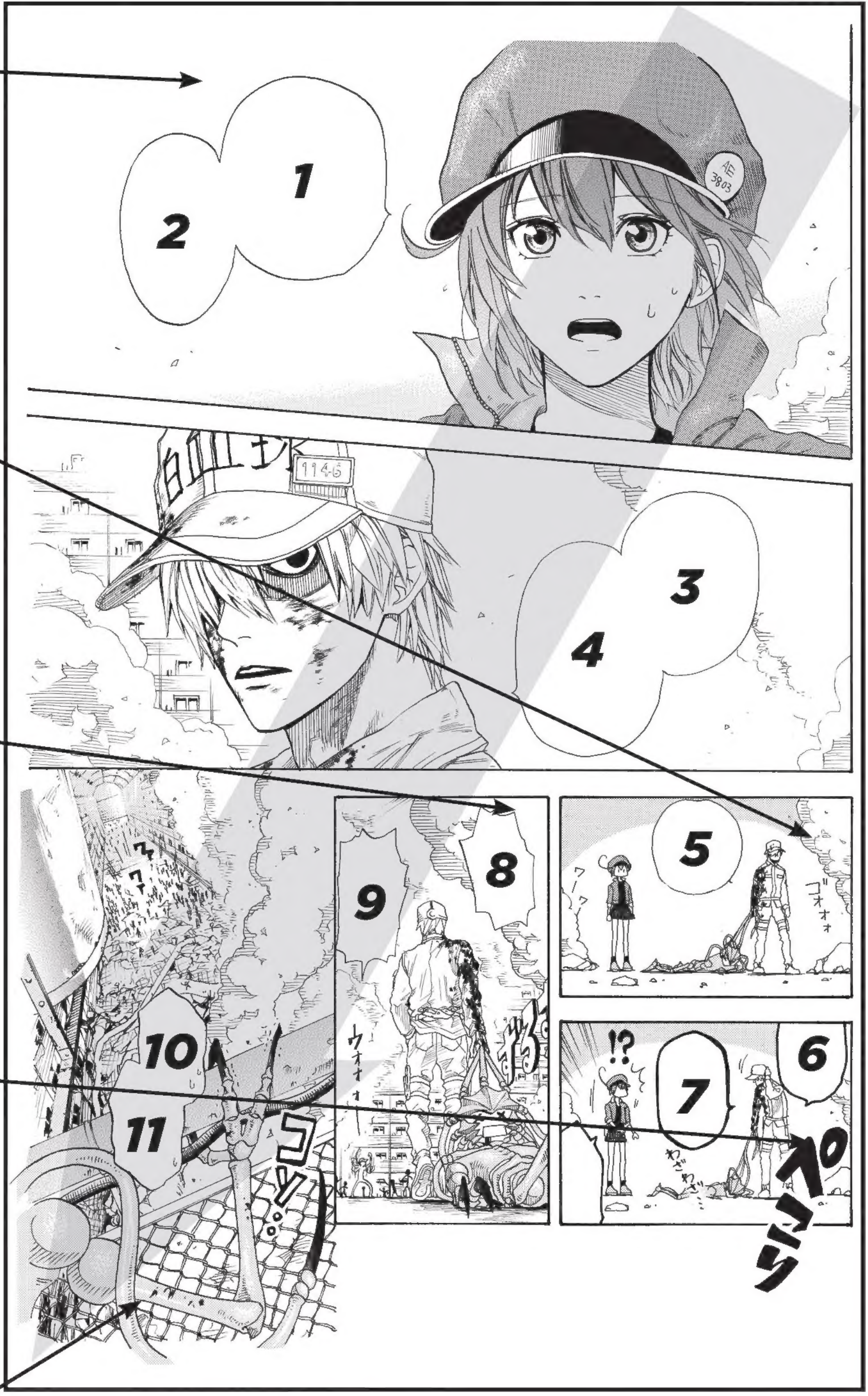


Start here, at the top right corner of the right hand page.

Read right to left, then top to bottom. In this panel, the leftmost speech balloon comes before the one in the top left corner.

Now continue on to the top right corner of Page 11.

Page 11



On this page, the top two panels are read first.

This panel is the top right-most after the first two, so it's next.

If you go to this panel next, you would have to move backwards (right) to read balloons 6 and 7.

Instead, after reading balloon 5, you move down to 6 and 7, then left...

...and then you arrive at the end of the page!

After a few pages, you'll be reading manga like a pro—*Japanese-style!*

止まれ

(That means **STOP**)

You're about to read a *manga*—a Japanese comic—presented in its original page order, which means you start at the other end of the book. If you need a quick guide on how to read manga the way it was meant to be read, flip to the next page—otherwise, turn the book over and enjoy!